The NATIONAL GEOGRAPHIC MAGAZINE

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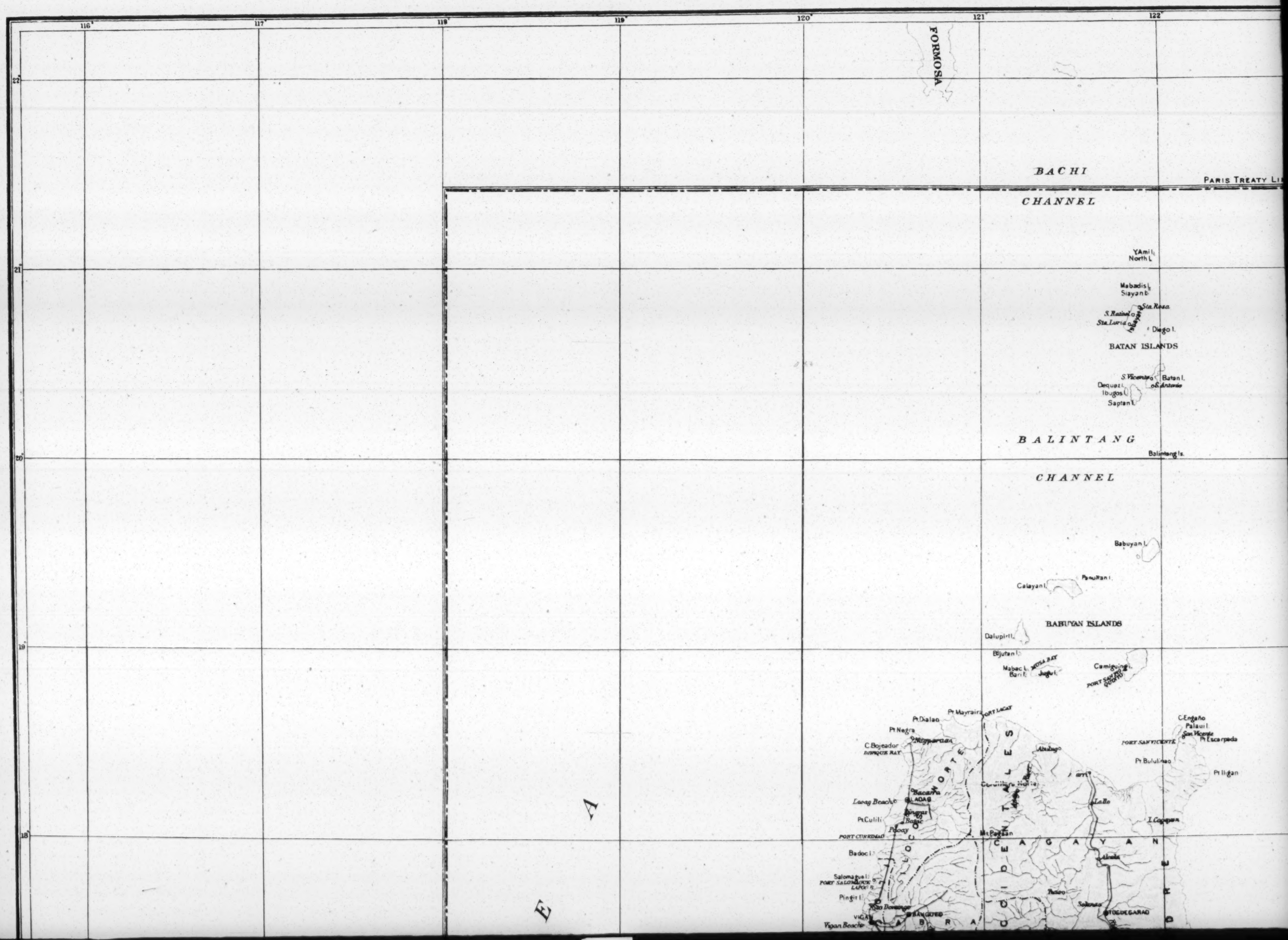


116°
117°
118°
119°
120°
121°
122°
22°
21°
20°
19°
18°
FORMOSA
BACHI
CHANNEL
PARIS TREATY LI
Y Ami I.
North I.
Mabadis I.
Siayan I.
Sta. Rosa
S. Rafael
Sta. Luria
Diego I.
BATAN ISLANDS
S. Vicente
Batan I.
S. Antonio
Dequez I.
Ibugos I.
Saptan I.
BALINTANG
Balintang Is.
CHANNEL
Babuyan I.
Panultan I.
Calayan I.
BABUYAN ISLANDS
Dalupiri I.
Bijutan I.
Mabac I.
Bari I.
Jugu I.
Camiguin I.
Pt. Mayraira
PORT LACAY
Pt. Dialao
Pt. Negra
C. Bojeador
DIPIQUE BAY
Bacarra
LAOAG
Lacag Beach
Pt. Culili
Pooay
PORT CURRIMAO
Badoc I.
Salomague I.
PORT SALOMAGUE
Pingit I.
VIGAN
Vigan Beach
BANGUED
Abulug
Cordillera Norte
Lallo
Mt. Pagsan
C A G A Y A N
Alcala
Tuzo
Solanas
TUGUEGARAO
C. Engaño
Palaui I.
San Vicente
Pt. Escarpada
PORT SAN VICENTE
Pt. Bululinao
Pt. Iligan
I. Cagayan
E
A

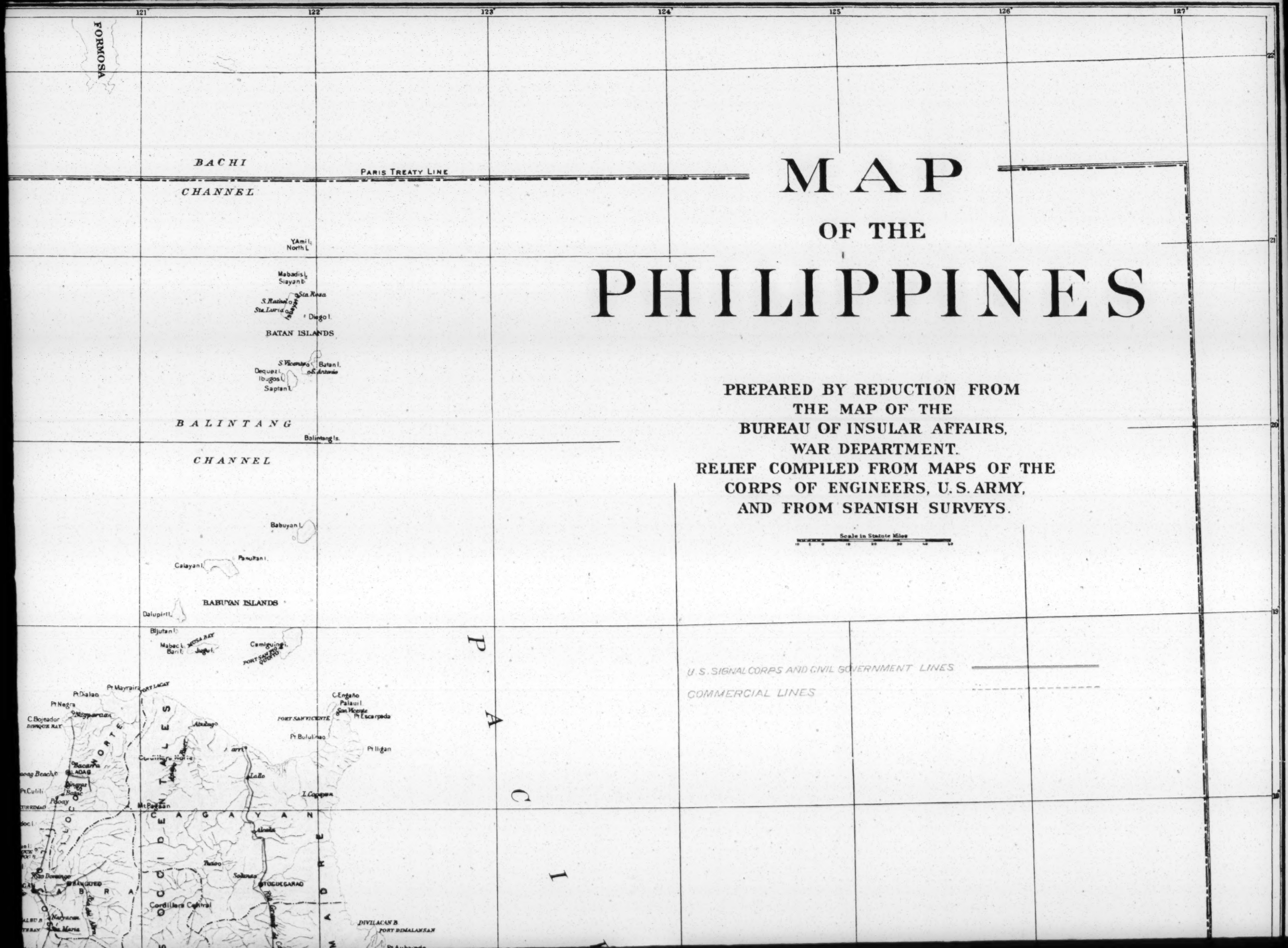
MAP
OF THE
PHILIPPINES

PREPARED BY REDUCTION FROM
THE MAP OF THE
BUREAU OF INSULAR AFFAIRS,
WAR DEPARTMENT.
RELIEF COMPILED FROM MAPS OF THE
CORPS OF ENGINEERS, U.S. ARMY,
AND FROM SPANISH SURVEYS.

Scale in Statute Miles

U.S. SIGNAL CORPS AND CIVIL GOVERNMENT LINES

COMMERCIAL LINES



CHANNEL

Babuyan I.

Calayan I.

Panuitan I.

BABUYAN ISLANDS

Dalupiri I.

Bijutan I.

Mabac I.

Barit I.

MOSA BAY

Jugut I.

Camiguingi I.

PORT SAN JOSE QUOQUO

Pt. Dalao

Pt. Mayraira

PORT LAGAY

Pt. Negra

C. Bojeador

DINGRAS BAY

Nagparan

Abulog

C. Engaño

Palaui I.

San Vicente

Pt. Escarpada

PORT SAN VICENTE

Pt. Bululiao

Pt. Iligan

Cordillera Norte

Lallo

I. Capones

Lacag Beach

LAOAG

Pt. Culili

Bacsil Bay

Bacsil

Paoay

PORT CURRIMAO

Mt. Pagsan

Badoc I.

Salomague I.

PORT SALOMAGUE

LAPOG B.

Pingiri I.

Alcala

Tuao

Solana

TUGUEGARAO

Sto. Domingo

VIGAN

Vigan Beach

BANGUED

Cordillera Central

DIVILACAN B.

PORT DINALUNGAN

Pt. Aubarede

PORT MACALLAN

PALANAN B.

NALBU B.

PORT SAN ESTEBAN

Sta. Maria

Pt. Candoo

Cannon Rocks

LEPANTO-BONTOC

Mt. Nimo

Mt. Data

7364 Ft.

Mt. Pantaguan

CERVANTES

ILAGAN

Sta. Isabel

Namapaoang

Dangapog

Mt. Binmaca

S. Juan

PORT SAN FERNANDO

Pt. S. Fernando

S. FERNANDO

Aguilian

BENGUET

Cordillera Sur

BAGUIO

BAYOMBONG

Pt. Dinapigui

DILASAC B.

Santiago I.

PORT BOLINAO

Bolinao

Pt. Piedras

LINGAYEN

Anda I.

Zaragoza

PORT SANTO TOMAS

Mt. Santo Tomas

GULF

Alaminos

Cabarian I.

PORT SUAL

Pt. Bolinao

Binalatongan

Urdaneta

Caranglaan

Carabalios Sur

Cauayuran

CASTOUBAN B.

PRINCIPE

ATTACHED TO TAYABAS

C. San Ildefonso

Culebra I.

BASOL BAY

Basol

Hermana mayor I.

Hermana menor I.

Malasiqui

Carlos

Mincadao

Camilingo

Parocha

Tarlac

Victoria

Gerona

TARLAC

Pt. Sua

DINGALAN B.

S. Salvador I.

PORT MATALVI

Pt. Palauig

Masinloc

Pt. Bolinao

Capones Is.

SAN ISIDRO

Mt. Arayat

Arayat

S. Miguel

S. Luis

Magalang

Angeles

Porac

Mexico

Macabebe

Hagonoy

BULACAN

BACOLOR

Pt. Panampalan

BINANGONAN B.

Pt. Banta

Polillo I.

Pulasan I.

Talim I.

Talim Is.

Fortified Pt.

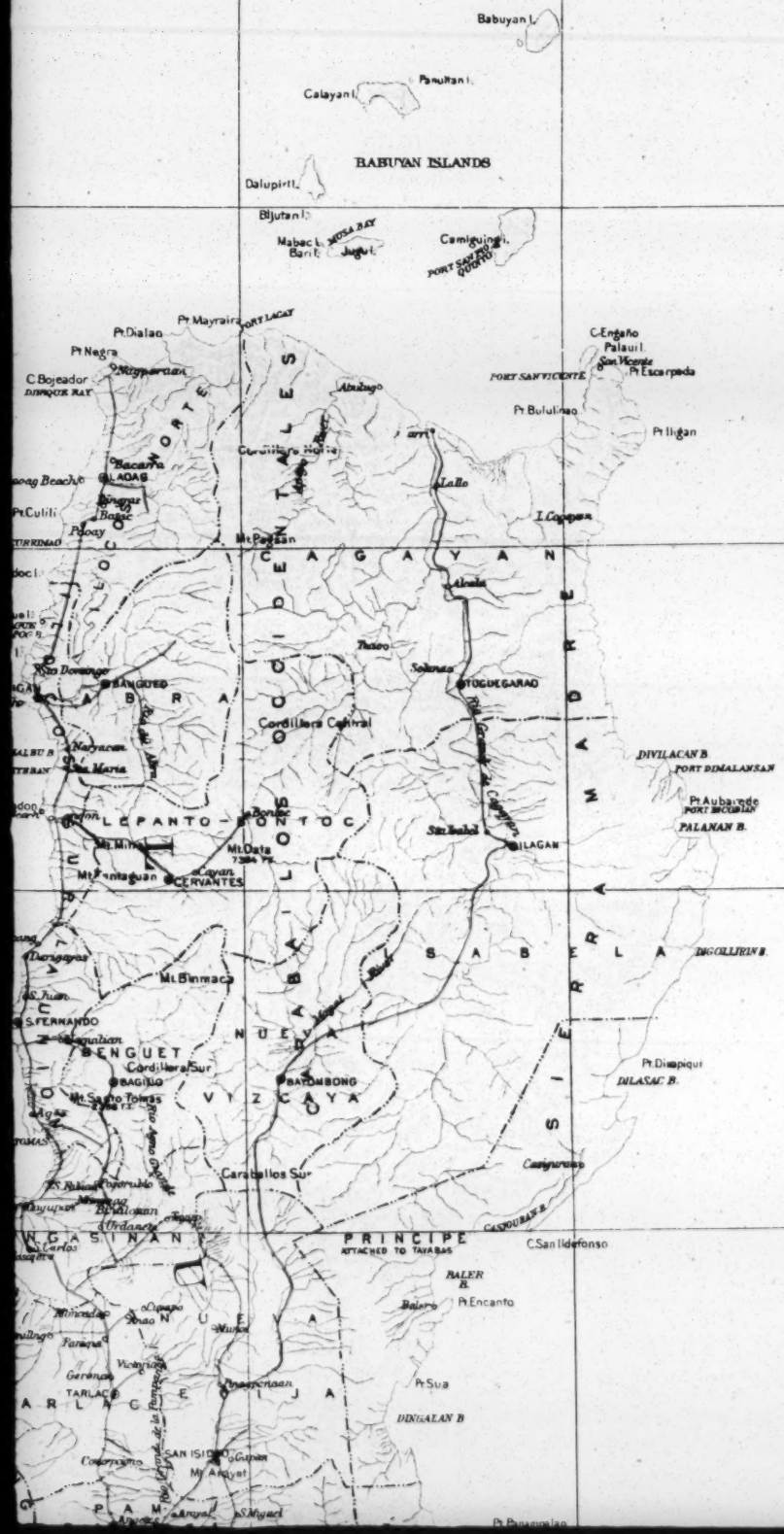
XUM

THE MAP OF THE BUREAU OF INSULAR AFFAIRS, WAR DEPARTMENT. RELIEF COMPILED FROM MAPS OF THE CORPS OF ENGINEERS, U.S. ARMY, AND FROM SPANISH SURVEYS.

Scale in Statute Miles

U.S. SIGNAL CORPS AND CIVIL GOVERNMENT LINES

COMMERCIAL LINES



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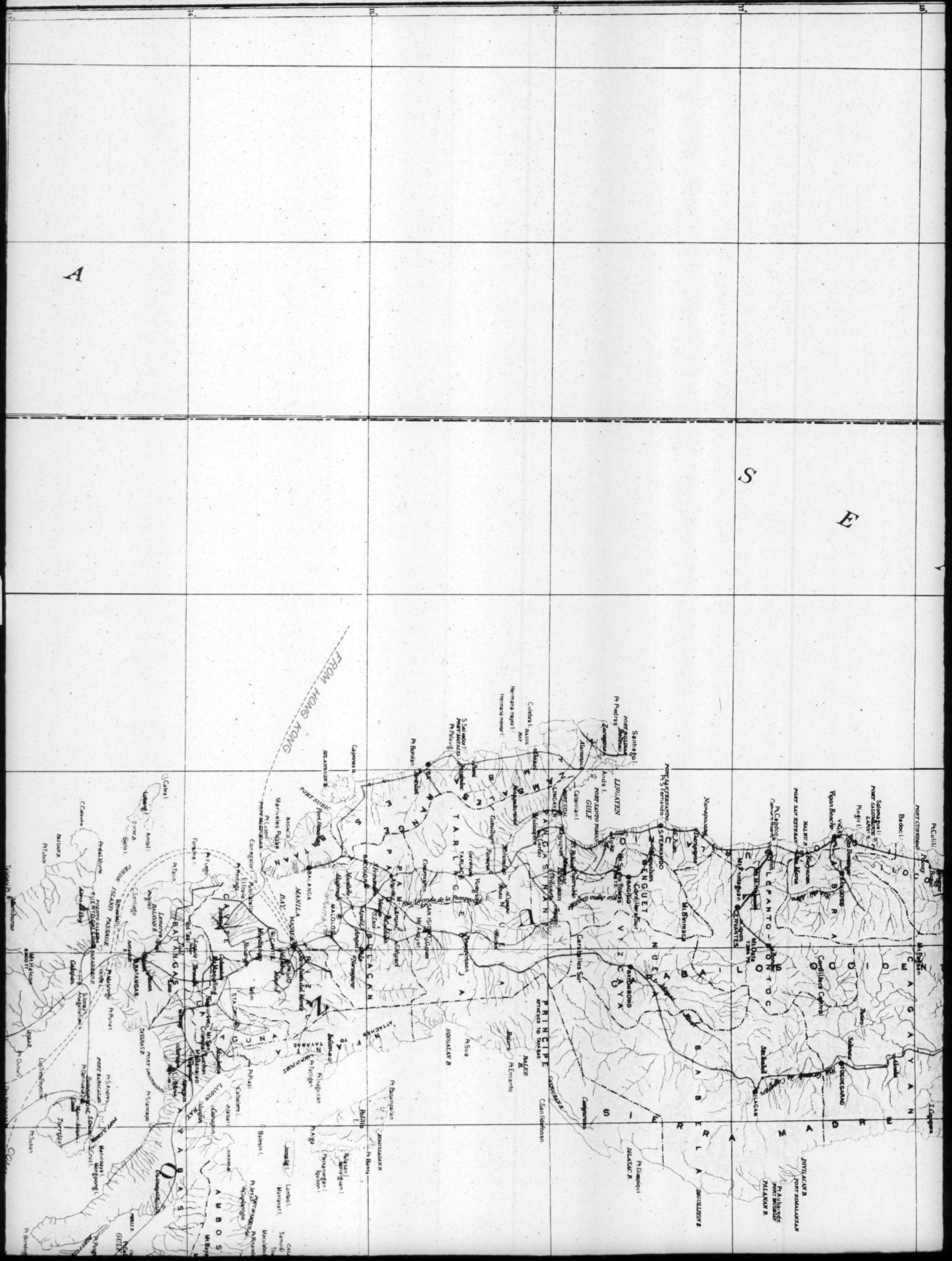

A
S
E
FROM HONG KONG
MANILA BAY
MANILA
BATANGAS
BATAAN
CAVITE
LAGUNA
TARLAC
PAMPANGA
PANGASINAN
ZAMBALES
BENGUET
LEPANTO-BONTOC
NUEVA VIZCAYA
CAGAYAN
ISABELA
ILOCOS SUR
ILOCOS NORTE
PRINCIPE
ATTACHED TO TARLAC
AMBOS
Pt Cutiti
Pt Bauge
PORT CENTENNIAL
Mt Pagsan
I. Capones
Baboc I.
Salomague I.
PORT SALOMAGUE
LAOAG
Pinget I.
Vigan
Vigan Beach
PORT SAN ESTEBAN
Pt Capdon
Mt Data
Mt Bonbon
Mt Pantagan
Cordillera Central
Sabangan
BONTOC
BAGUIO
Pt Diaz
Pt Bolinao
Namagpacan
Pangasinan
PORT SAN FERNANDO
Pt S Fernando
S FERNANDO
Mt Binasac
Cordillera Caraballo Sur
Caraballos Sur
Pt Subic
Santiago I.
Pt Pedras
PORT PEDRAS
Zoograph
Anda I.
PORT SANTO TOMAS
GULF
Alaminos
Cabalitian I.
LINGAYEN
PORT STGIL
Lingayen
Pt Baluarte
Pt Bolinao
Hermana mayor I.
Hermana menor I.
Culebra I.
BASCO
BAY
Mabanbanan
Malabon
Pt Bolinao
S. Salvador I.
PORT MATALVI
Pt Patalog
Pt Bolinao
Capones I.
Pt Bolinao
Pt Lubid
PORT MATALVI
Mariveles Reales
Pt Mariveles
Pt Reales
Corregidor I.
Pt Fraile
Pt Reales
PORT STUBIC
Port Stubic
SOLANGAN B.
Cabra I.
Liberg I.
Amisl.
Solol.
Pt Tabio
Pt Tabon
Pt Tabon
Pt Fortune
Fortune I.
Pt Tabin
Lemery Point
Pt Lemery
Pt Lemery
Pt Punal
Pt Punal
Pt Punal
Pt Santiago
Pt Santiago
Pt Santiago

18°

17°

16°

15°

14°

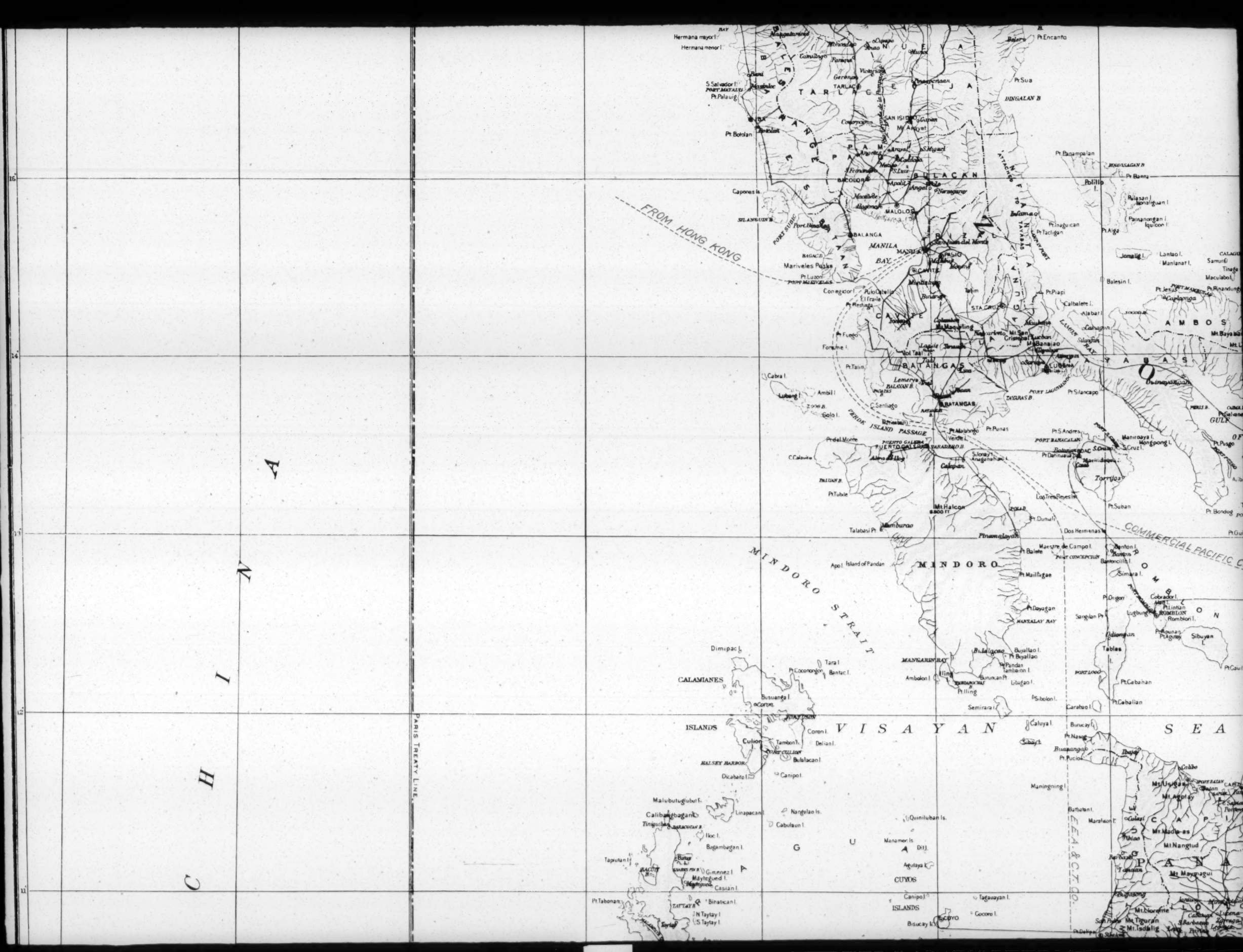
S E A

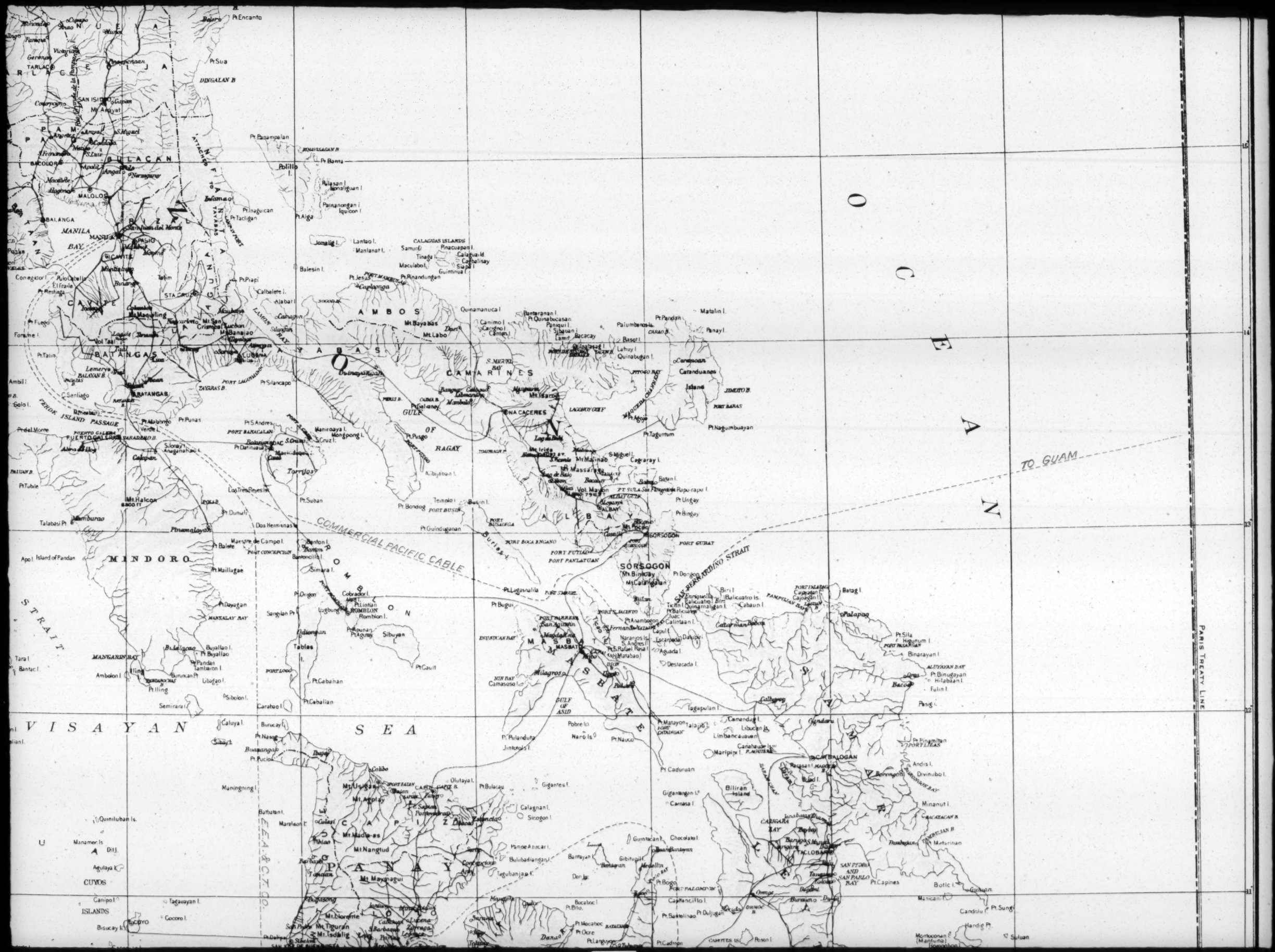
A

FROM HONG KONG

Pt.Culili
Bangar
Baloc
Poloey
PORT CURRIMAO
Mt.Pantan
I.Capones
Badoc I.
Salomague I.
PORT SALOMAGUE
LAOAG B.
Pingit I.
San Domingo
BANGUED
VIGAN
Vigan Beach
CAGAYAN
Alcala
Tuao
Solana
TUGUEGARAO
Cordillera Central
MALBU B.
PORT SAN ESTEBAN
Nagyacan
Sta. Maria
DIVILACAN B.
PORT DIMALANSAN
Pt.Aubarede
PORT BICOLIN
PALANAN B.
Pt.Candon
LEPANTO-BONTOC
Mt.Mirin
Mt.Data
7364 Ft.
Mt.Pantaguan
CERVANTES
San Isidro
ILAGAN
SIERRA MADRE
Nanapacuan
Dangcagan
Mt.Binmaca
DIGOLLIVIN B.
S.Juan
PORT SAN FERNANDO
Pt.S.Fernando
S.FERNANDO
BENGUET
Cordillera Sur
NUEVA VIZCAYA
Pt.Dinapigui
DILASAC B.
Santiago I.
PORT BOLINAO
Bolinao
Pt.Piedras
LINGAYEN
Zaragoza
Anda I.
PORT SANTO TOMAS
Mt.Santo Tomas
7816 Ft.
BAGUIO
BATOMBONO
GULF
Alaminos
Catanlian I.
Carabalio Sur
Casiguran
PORT SUAL
LINGAYEN
Binalatongan
Urdaneta
PANGASINAN
PRINCIPE
ATTACHED TO TAYABAS
C.San Ildefonso
Culebra I.
BASOL BAY
Hermana mayor I.
Hermana menor I.
Malasiqui
Mangatarem
Mincadan
Camilingo
Tarlac
Victoria
Gerona
Cuyapo
Munoz
BALER B.
Baler
Pt.Encanto
Pt.Sua
DINGALAN B
S.Salvador I.
PORT MATALVI
Pt.Palauig
TARLAC
SAN ISIDRO
Mt.Arayat
Pt.Botolan
Capones Is.
SILANGUIN B.
Port Binanga
BULACAN
Pt.Panampalan
BINANGONAN B.
Pt.Binta
Polillo I.
Pulasan I.
Bonalirguan I.
Painanongan I.
Iquicon I.
Pt.Alga
Pinaguican
Pt.Tacligan
BALANGA
MANILA
MANILA BAY
Mariveles Pucka
Pt.Luzon
PORT MARIVELES
Corregidor I.
Pulo Caballo
El Fraile
Pt.Reshaga
Pt.Fuego
Fortune I.
CAVITE
Binacayan
Pt.Piapi
Calbalete I.
Alabat I.
Balesin I.
Jomalig I.
Lantao I.
Manlanat I.
CALAGUA
Samuro
Tinago
Maculabo I.
Pt.Jesus
Pt.Binandungan
Caplaonga
AMBOS
Mt.Bayabas
Mt.L
Cahagan
Silangan
LAMON BAY
TAYABAS
Mt.Banahao
Mt.San Cristobal
Luchan
Lubena
BATANGAS
Pt.Talim
Cabra I.
Lubang I.
Ambil I.
Golo I.
Lemery
BALAYAN B.
Balayan
BATANGAS
TAYABAS B.
Pt.Silangapo
C.Santiago
VERDE ISLAND PASSAGE
Pt.Mabacong
Pt.Punas
Verde I.
Pt.S.Andres
PORT BANACALAN
Manrroaya I.
Mongpong I.
S.Cruz I.
Pt.Pugo
GULF OF
Pt.del Monte
PUERTO GALERA
PARADISE B.
C.Calavite
Silonay I.
Anagenahan I.
Calapan
Pt.Dalimanat
Tortugas
BALIAN B.
Pt.Tubli
Mt.Halcon
8200 FT.
Los Tres Reyes Is.
Pt.Dumali
Pt.Suban
Pt.Bondog
XUM

CAGAYAN
CORDILLERA CENTRAL
SIERRA MADRE
LEPANTO-BONTOC
ABRA
BENGUET
NUEVA VIZCAYA
PRINCIPE
ATTACHED TO TAYABAS
QUIRINO
NUEVA ECIJA
PAMPANGA
BULACAN
ZAMBALES
TARLAC
PANGASINAN
MANILA BAY
CAVITE
BATANGAS
TAYABAS
AMBOS CAMARINES
LAGUNA DE BAY
PHILIPPINE SEA
LUZON STRAIT
SAN BERNARDINO STRAIT
SAN JUANICO STRAIT
LINGAYEN GULF
LAGONOY GULF
GULF OF RAGAY
TO GUAM
Mt. Pulog
Mt. Data 7364 Ft.
Mt. Binmaca
Mt. Santo Tomas
Mt. Isarog
Mt. Labo
Mt. Bayabas
Mt. Banahao
Mt. Arayat
Mt. Pantaguan
Mt. Iriga
Mt. Malinao
Mt. Massaraga
Vol. Mayon
Vol. Taal
Mt. San Cristobal
Mt. Makiling
Mt. Natib
Mt. Mariveles
Mt. Pinatubo
Mt. Cetaceo
Mt. Labi
Mt. Tapulao
Mt. Redondo
Mt. Tres Marias
Mt. Tuble
Mt. Halcon
Mt. Mingan
Mt. Cayapo
Mt. Amuyao
Mt. Polis
Mt. Pocsan
Mt. Mirador
Mt. Pantaguan
Mt. Arayat


FROM HONG KONG
PARIS TREATY LINE
COMMERCIAL PACIFIC C
CHINA
A
BAY
Hermana mayor I.
Hermana menor I.
Pt. Encanto
Pt. Sua
DINGALAN B
S. Salvador I.
PORT MATALVI
Pt. Palauig
Pt. Botolan
SAN ISIDRO
Pt. Banpampalan
BULACAN
Capones Is.
Pt. Inaguican
Pt. Tacligan
Pt. Alga
Polillo I.
Pt. Santa
Bulasan I.
Panamongan I.
Iquicon I.
Jomalig I.
Lanton I.
Manlanat I.
Balesin I.
Pt. Jesse
Pt. Binandung
Calaguimga
Maculabol I.
Pt. Piapi
Calbalete I.
Alabat I.
AMBOS
Mariveles Pt.
Pt. Luzon
Corregidor I.
Pt. Fuego
Fortune I.
MANILA
MANILA BAY
CAVITE
STA. CRUZ I.
Mt. Maquiling
Mt. San Cristobal
Mt. Banahao
BATANGAS
Pt. Talim
Cabra I.
Lubang I.
Ambil I.
Golo I.
Lemery
BALAYAN B.
C. Santiago
BATANGAS
Pt. Silangapo
TAYABAS B.
PORT LAUREL
PERIDO ISLAND PASSAGE
Pt. Nasbinto
Pt. Punas
Pt. S. Andres
PORT BANACALAN
Manroaya I.
Mongpong I.
S. Cruz I.
Pt. Del Monte
PUERTO GALERA
PUERTO GALERA B.
C. Calavite
Silonay I.
Anagana Is.
Calapan
Pt. Tuble
PALUAN B.
Torrijos
Los Tres Reyes Is.
Mt. Halcon
8,800 FT.
Pt. Dumali
Pt. Suban
Pt. Bondog
Talabasi Pt.
Mamburao
Pinamalayan
Dos Hermanas Is.
Maestre de Campo I.
Pt. Balete
Banton I.
Bantoncillo I.
MINDORO
Apo I. Island of Pandan
Pt. Mailfagae
Pt. Origon
Cobrador I.
Pt. Lintian
ROMBLON
Rombion I.
Sibuyan I.
Pt. Dayagan
MARSALAY BAY
Sanglan Pt.
Lugbung
Odiongan
Tables I.
Pt. Cabahan
Pt. Cabalian
Pt. Caui
Buyallao I.
Pt. Buyallao
Pandan
Tambaron I.
Libagao I.
Burucan Pt.
Ambolon I.
Ilin
Pt. Iling
Sibolon I.
Semirara I.
Caratao I.
MANGARIN BAY
PORT LOOC
Dimipac I.
Tara I.
Pt. Coconongon
Bantac I.
CALAMIANES
ISLANDS
Busuanga I.
Coron
Coron I.
Culion
Tambon I.
Delian I.
PORT CULION
Bulalacao I.
HALSEY HARBOR
Dicabaro I.
Canipo I.
Malubutuglubut Is.
Calibangbagan I.
Linapacan I.
Nangalao Is.
Cabulauan I.
Tinigubban
BARCOTAN B.
Iloc I.
Bagambagan I.
Taputan I.
Buton
Gimenez I.
Maytegued I.
Casian I.
RACOTT
Pt. Tabonan
Binatican I.
TAYTAY B.
N. Taytay I.
S. Taytay I.
Taytay
G U A D
CUYOS
ISLANDS
Quiniluban Is.
Manamen Is.
Agutaya I.
Canipo I.
Tagauayan I.
Cocoro I.
COYO
Bisucay I.
VISAYAN
SEA
Caluya I.
Sibay I.
Buruay I.
Pt. Nasog
Buagangao
Pt. Pucio
Maningning I.
Coiibo
Mt. Usugan
Mt. Arpiay
Battalan I.
Maralison I.
Mt. Madia-as
Mt. Nangtud
Mt. Mayngagui
Pt. Bioranie
Mt. Tiguran
Mt. Tadalig
Pt. Pugo
GULF
Pt. Galvez
PORT BATAN
PANAY
CAPIZ
Pt. Delgado
Pt. Guiuan
XUM



OCEAN
TO GUAM
COMMERCIAL PACIFIC CABLE
PARIS TREATY LINE
VISAYAN SEA
MINDORO
STRAIT
MANILA BAY
BULACAN
CAVITE
BATANGAS
AMBOS
CAMARINES
ALBAY
SORSOGON
MASBATE
PANAY
CAPIZ
CUYOS ISLANDS
CALAGUAS ISLANDS
GULF OF RAGAY
SAN BERNARDINO STRAIT

CHINA

PARIS TREATY LINE.

MINDORO STRAIT

MINDORO

PHILIPPINES

COMMERCIAL PACIFIC

CALAMIANES ISLANDS

VISAYAN SEA

CUYOS ISLANDS

PALAWAN

PARAGUA

SULU

Mt. Halcon 8,500 ft.

Mt. Usigan

Mt. Apolay

Mt. Madia-as

Mt. Nangtud

Mt. Mayngaui

Mt. Siburan

Mt. Iglit

Mt. Tiguran

Mt. Isdalig

Victoria Peak

Mt. Landergan

Mt. Mantalingajan

Coron

Culion

Busuanga I.

Dimipac I.

Tara I.

Pt. Coconongon

Bantac I.

Ambalon I.

Ilin

Pt. Illing

Semirara I.

Caluya I.

Coron I.

Tambon I.

Delian I.

Bulalacao I.

Canipo I.

Dicabaito I.

Malubutuglubut I.

Calibangbagan

Linapacan I.

Nangalao Is.

Cabulaun I.

Quinluban Is.

Manamoc Is.

Agutaya I.

Iloc I.

Bagambagan I.

Tapiutun I.

Gimenez I.

Maytegued I.

Casian I.

Binatican I.

N. Taytay I.

S. Taytay I.

Palij I.

Pt. Tabonan

Boayan I.

Cacnipa I.

Cacbolo I.

Carandaga I.

Dalanganem I.

Cambary I.

Quintad I.

Dumaran I.

Pt. High

Mesa Pt.

Fondeado I.

Malanao I.

Flat I.

East I.

Pt. Nariz

Tubbataha Is.

Pt. Larga

PUERTO PRINCESA

Pt. Iglesia

Bulilayan C.

Pandanan I.

Cagayanes

Cagayan

Cavili

Arena I.

Pt. Obon

Pt. Cansilan

Pt. Tuble

Talabasi Pt.

Apo I. Island of Pandan

Pt. Dunali

Los Tres Reyes Is.

Pt. Suban

Dos Hermanas

Maestre de Campo I.

Pt. Balete

Pt. Maillagae

Pt. Dayagan

Sangilan Pt.

Pt. Origon

Cobrador I.

Pt. Lintian

Romblon I.

Simara I.

Buyallao I.

Pt. Buyallao

Pt. Pandan

Tambaron I.

Libagao I.

Sibolon I.

Tablas I.

Pt. Cabahan

Pt. Cabalian

Pt. Apunan

Sibuyan I.

Maniguing I.

Batbatan I.

Marilaon I.

Pt. Nasog

Buenavista

Pt. Pucio

Pt. Dalipas

Pt. Lusaran

Pt. Lagdan

Nagal I.

Pt. Bunan

Guimaras Island

Pt. Cansilan

Linapacan Strait

Mindoro Strait

Commercial Pacific

Paris Treaty Line

Malanut Bay

Islas Bay

Green Island Bay

Port Concepcion

Port Royalist

Port Camagan

Halsey Harbor

Port Culion

Port Lodo

Mansalay Bay

Mangarin Bay

Tagburos Bay

Tagauayan I.

Gocoro I.

Bisucay I.

Capnoyan I.

Sibaya I.

Buenavista

San Joaquin

Strait of Iloilo

Guimaras Strait

Linapacan Strait

Port Camagan

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Mt. Mantalingajan

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Marasi B.

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Port Royalist

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Port Culion

Port Lodo

Mansalay

Port Concepcion

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Sulu Sea

Visayan Sea

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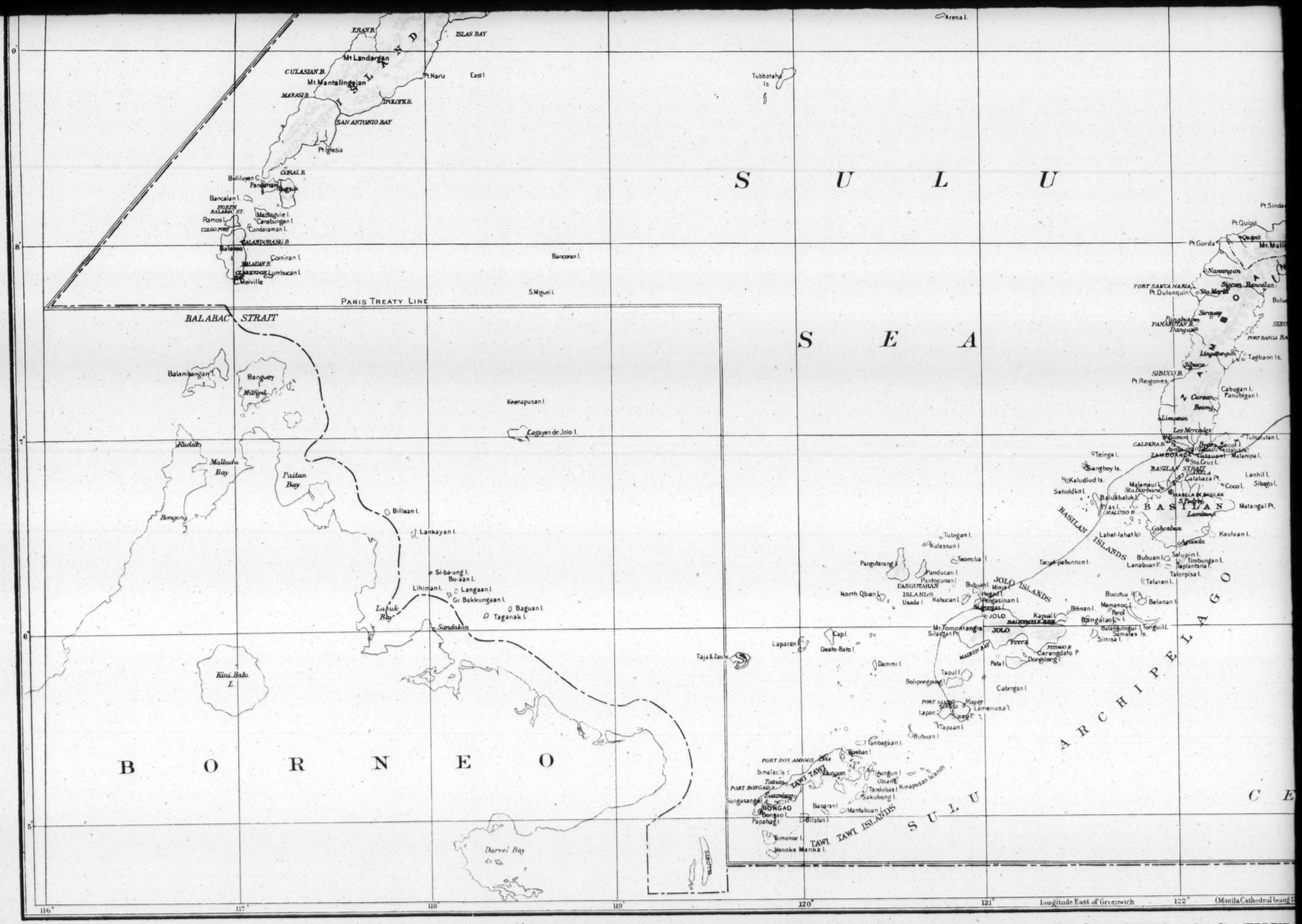

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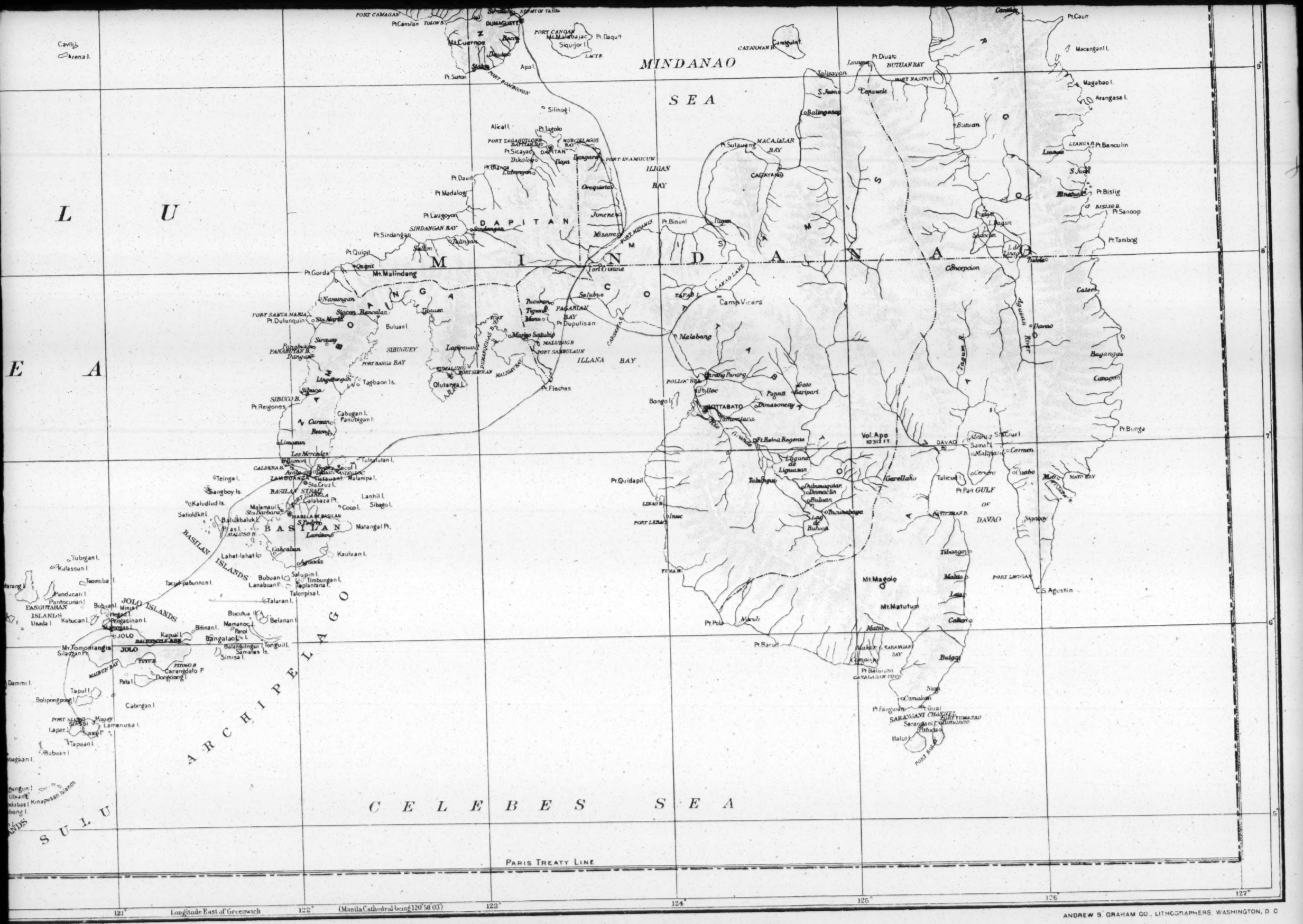

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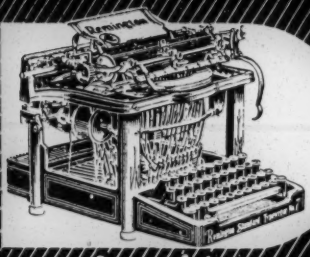

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VOL. XVI, No. 8 WASHINGTON AUGUST, 1905

THE NATIONAL GEOGRAPHIC MAGAZINE

THE PHILIPPINES*

BY THE SECRETARY OF WAR, HON. WILLIAM H. TAFT

WHEN your veracious committee came to see me to invite me to address the National Geographic Society I gathered from what they said—possibly they did not say it directly—that I was to have the pleasure of sitting and talking in a parlor with a few ladies and gentlemen much interested in geography and the far countries of the world; who would not require a speech or lecture, but merely an informal talk. I said to them that my engagements at present were such as to make it altogether impossible for me to prepare anything which would be worthy of an august audience. They said, "That is entirely unnecessary. Talk about the Philippines, you know all about that, and you can talk that in a parlor without difficulty." And so I did not know until this morning, when I was advised where I would find the Rifles' Armory, that I was to speak to so intelligent, and, I may be permitted to say, "terrifying" an audience as this. I make this explanation both because of the desultory character of the remarks which you shall hear, and also to avoid the charge which I am constantly receiving at home from my wife and my mother, whose instructions I hope to follow, that I should not harp on one string so much.

Those who are responsible for the Philippine administration under this government have had the disadvantage, or advantage, of being subject to criticism ever since they began, on all sides. For a long time—if I may designate what they said by so opprobrious a term—the "noise" came from the anti-imperialists, and we were attacked for oppressing a people struggling for independence. We were attacked, after we had taken control, for not giving at once to that people all the liberties they were entitled to. We were attacked for proposing to stay any number of years there in order to enable that struggling people to get upon their feet. When it was suggested that we should stay and educate them, it was said to be altogether too long.

Well, we have fought out that fight, if I understand it, with the American people, and that people, being a sensible people, have decided that, so far as the issue raised by the taking of the Philippines and our establishing a government

*An address before the National Geographic Society, May 5, 1905

there are concerned, those issues are settled; and therefore we may properly turn to the critics whom, with deference for the anti-imperialists of Boston and elsewhere, I regard as much more formidable, the critics who found what they have to say in derogation of our government upon the experience of the greatest colonial government of the world—the British Empire; and we find, curiously enough, or perhaps not so curiously, though, when you come to consider the facts, that the very things for which we are attacked by the anti-imperialists in the Philippine government are made the only basis for approval on the part of the British critics. And in what I have to say tonight I should like to take up, not in very great detail, but subject by subject, the grounds for the criticisms of the Philippine government which have appeared in publications of the British critics.

The first one of these, who is hardly worthy of notice, yet I do notice him for the purpose of saying one or two severe things about him—he deserves it—is Mr John Foreman. Mr John Foreman published a book upon the Philippine Islands before they came under the American regime that, on the whole, furnished the most material and possibly the best information, the most accurate information, although there were a great many inaccuracies in it, concerning the Philippine Islands. He left the islands, it was said, because of some strictures which he made upon the Spanish friars, and did not return there until long after the Americans had established a government. Then he made a very summary visit, and returned last summer in time to publish an article in the *Fortnightly Review* on what the Americans had done in the Philippines.

I suppose that the editors of that very reputable review permitted the publication of the article because Mr Foreman had established a good reputation by the book which he had published; but no one can read it, and read between the lines, without perceiving the bitterness and utter irresponsibility of the criticisms which he made upon the present condition of affairs in the island. He must first, although professing to hold in the greatest contempt those who were struggling for independence in the islands, have made his home with irreconcilables, for he gave credence to the very wildest statements concerning the government which I am in a position, having formed a part of that government, to be able to deny without hesitation. He had an insinuating way of saying, for instance, "The government is now taking up the work of the Spanish government, proceeding with the harbor works, which will bring into use 160 acres of valuable lands just below the Malecon drive, for warehouses and other purposes. This will doubtless be appropriated by the Americans in the government service." He had no foundation, so far as I know, for saying that the lands would be disposed of except at public auction, and it is a gratuitous insult to any one connected with the government to suggest that those of us who are connected with the government would divide these lands between us.

Now, I pass Mr Foreman by with the statement that the character of his article entitles him to be classed in the category of those "European waifs" who are found upon the shores of the Orient. We had in Manila a collection of persons from America and Europe, and all along the shore between, attracted there by the disturbed condition of the country, whom it took us two full years to eliminate, and when they found the police force of Manila growing more and more strict in its regard for the presence of good individuals and the absence of bad individuals, they took up their march, or their swim, or their sail up the coast, and they put in at Shanghai, which seems to be the final home of all the ocean waifs of the

Orient and of most of the Oriental liars; and they, becoming established there, became very well known in Manila in my time as "Shanghai roosters." They occupied most of their time in libelling the American government. I am bound to say that Mr Foreman has established his claim to take a position on that roost.

The next of these British critics is Mr A. R. Colquhoun, a gentleman of a very different order from Mr Foreman, if we may judge by the writings of the two. Mr Colquhoun has been the correspondent of the London *Times*, was at one time in the colonial service of Great Britain, was the district governor, or commander, of a district in Burma, is a gentleman in every way, and has written two very interesting books—one "The Mastery of the Pacific," and the other "A Greater America." Mr Colquhoun traveled with the commission when we were establishing civil governments in the islands. He was about three weeks in the islands at one time, and about ten days at another. I have a great respect for him, and read what he had to say with keen interest. I shall not take up what he had to say, because what he has had to say has been amplified and treated with more elaboration, and possibly with more authority, by another Englishman or Scotchman, Mr Alleyne Ireland, now connected with the Chicago University, and whose experience in the investigation of tropical colonies makes what he says worthy of consideration, and makes it, also, most interesting.

THEY SAY WE ARE SPENDING TOO MUCH FOR EDUCATION

Now, his first criticism of the Philippine government is that it has devoted three million dollars a year, or at least 25 per cent, and perhaps more, of its total revenue, for education, and he says that that money would be much better expended in the construction of roads and in the material development of the country. He says this because experience in English colonies makes him think that the Filipino needs material development much more than he does mental development, by no means admitting, however, that he has mental development sufficient to dispense with any of it. Upon this subject those of us who are responsible for the course pursued in the Philippines must take issue. The question as to which is right of the two policies depends upon and goes back to the purpose of the colonization. We blundered into colonization; we did not go into it with malice aforethought. We found ourselves in possession of the islands because we could not help it, and then we determined that we would do the best we could with them, working out a policy as nearly consistent with the principles of our own government as was possible. Now, then, that means in the end a government of the people, by the people, and for the people; but a government of the people, by the people, and for the people is absolutely impossible unless you have the great body of that people with intelligence enough to exercise the strong public opinion that is necessary to sustain and restrain any popular government. If it be true, as Mr Ireland says, that tropical peoples are incapable of self-government and incapable of education up to self-government, then I agree that the argument is with him And he assumes as the basis of his argument the experience that the English have had in their colonies.

OUR COLONIAL PROBLEM IS ENTIRELY DIFFERENT FROM ENGLISH COLONIAL PROBLEMS

Well, you judge of how experience ought to lead you in your conclusions by how far that experience has gone. I am not aware as yet of any attempt on the part of England to try the peoples of tropical colonies in self-government or to educate them up to the point where they may be capable of self-government. Again, experience is useful

as the experience is in accord with the conditions which you expect to meet and to which you expect to apply that experience. The peoples that the English have had to handle in the tropics have been the Mohammedans and the Hindoos. They are a people whose religion is so deepseated that it is impossible to hope that they may ever in any great numbers be made Christians. The Mohammedans look with disdain on Christianity as an older religion. They have a new patent, and therefore they look with contempt on European ideas and on American ideas. Now, in the Philippines we have a very different condition of affairs. We have 6 millions of people, nearly 7 millions, who are sincere Christians, and who have been so for 250 years. They are Christian children because they have been brought up by the friars, who thought that it was unwise to expose them to the temptations and demoralizations of the Spanish or any other world. But they did instill in them the principles of Christianity, and they did turn their faces, their minds, and their ambitions toward Europe and toward America. It is from these two countries that these people derived their ideas. Therefore I think that we are right in saying that experience founded on dealing with Mohammedans and Hindoos in respect of popular self-government may be doubted as an absolute guide as to what we may expect to do with people who are the only Christian Malays and the only far-Oriental Christians.

Another objection which may be made to the education of these people is that if you educate them you will educate some of them so that they will become unruly; they will become constant revolutionists, and you will always have trouble. Well, I agree that it is possible to educate a man much beyond his capacity, so that he uses his education for purposes for which a man of much less education would not waste it. But the advantage and absolute necessity in a popular government of having public opinion that comes from a widespread intelligence, not profound, not university, but based on primary education, furnishes an antidote for the poison of the revolutionary tendency of light-headed, irresponsible characters.

You can tell often whether a people are fitted for education by whether they take to it or not. We have in the Philippines a much severer struggle to teach the Filipinos than they would have in the Malay states, or in Java, or in India, because we have a people who have no common language that is fit to be used by a civilized people, and therefore we have not only to teach them, but we have to teach them a different language from their mother tongue. There are some twelve different dialects or languages in the Philippines among the civilized tribes, and until they shall have a common language, it is hopeless to expect solidarity as a nation or intelligence as a people. Therefore we determined that we ought to teach them English. It is true that they had learned, some of them—about 7 per cent of them—Spanish, but they did not look to Spanish as a language which they cherished. Spanish is not the language of the Orient. Spanish is not the language of free institutions, and we concluded that as the question was only between teaching 93 per cent and 100 per cent we might as well do the job thoroughly and teach them English.

ARE WE FORCING ENGLISH DOWN THEIR THROATS AS WITH A FORCE PUMP?

Now, our anti-imperialist friends say, and I think that even the president of Cornell University has intimated, that we are forcing English down the throats of an unwilling people as with a force pump. As a matter of fact, the teaching of English began before civil government reached the islands; the instinct

of the Americans whether they wear a military uniform or the garb of peace, to teach the youth how they should grow and to spread intelligence, led the army into the establishment of an educational system in the Philippines, and in every company of that army two or three men were detailed right in the villages where insurrection was rife to open schools and teach the little Filipinos English. Of course, it was a defective school system, but nevertheless we found it there, and on what they had done we builded. We sent to America for a thousand school teachers, and we organized, and as the army pacified the islands we followed closely with civil government and with schools. Now, we had at the end of the first year after we reached there organized schools enough so that there were reciting in English 10 per cent of the youth of school age of the islands. The next year this was increased to 13 per cent, and last year it increased to 19 per cent, and there were in July and August of last year reciting in English in the schools 263,000 Filipino youth.

We do not have any compulsory school laws, because a compulsory school law is predicated on your having schools and teachers enough to teach all the youth in the community, and we have, as you see, only about one-fifth of the teachers needed and only one fifth of the school-houses needed. That is what we are doing now. Next year I have no doubt the increase will be 100,000. And all this indicates to you—at least it does to me—the earnest desire of those people, those children, and the fathers and mothers of those children that they should learn English, and that they should become educated. Now, there are 263,000 of them, and the average attendance is 70 per cent. That country is a country where between doing a thing and not doing it you usually choose not to do it, and therefore if 70 per cent of the pupils attend you may count on a very strong feeling in favor of education everywhere. The trouble is that we have not money enough to make their education what it should be. We do not want to make them university professors. We shall have a university there. We ought to have one simply as a keystone for the arch of education for a comparatively small number of Filipinos who can afford to take that education; but what we wish to do is to spread the primary schools, the manual-training, industrial, and normal schools. We are now using 800 American teachers, in the first place, to teach the Filipino teachers how to teach their Filipino children. In other words, we are hoping to build up a body of from ten to fifteen thousand Filipino teachers who can teach English, and thus teach the whole islands a new language—a common language and a language, as I have said, of free institutions. Now, it seems to me that this statement of mine, this statement of fact, itself answers my friend Mr Alleyne Ireland as to the wisdom of our expending 25 per cent of our income in teaching. It is what the people want, and we can be certain that if they learn the English language and read English books they will learn.

OUR SYSTEM OF GOVERNING THE PHILIPPINES IS DESIGNED TO TRAIN THE PEOPLE TO SELF-GOVERNMENT

Now, the next subject of criticism is as to the form of government. Mr Ireland says that we have made a mistake, because we have established municipal and provincial governments under the commission. We have had elective officers in the municipal governments; we have had an elective governor, who is one-third of the provincial council, the other two members being appointed under the civil-service rules and being, generally, Americans, the "fiscal" or prosecuting attorney being a native and the secretary of province being a

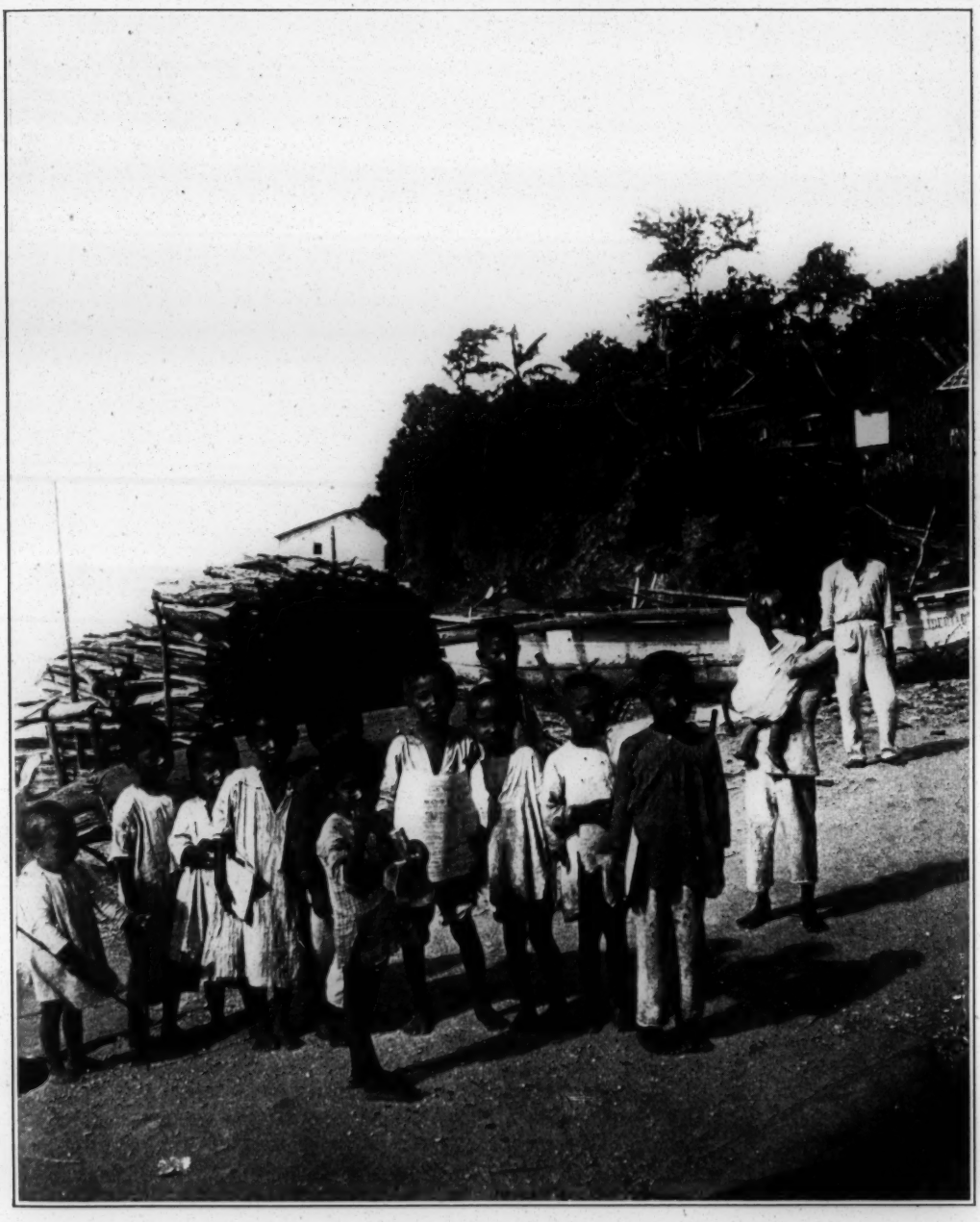
native. He says that that makes too many officers; that we would get along a good deal better if we followed the English custom of having one English commissioner, who acts as judge, as executive, as legislature, as everything else, and has under him natives who are intelligent enough to understand his commands and carry them out. Now, it is perfectly true that that government there could be much more efficient if we put an American in charge of every province and made him absolute ruler there. It would not be any trouble to do it at all. We would have less taxes, the work would be attended to with more care, and, on the whole, for the next ten or fifteen years it is probable that the people would be in better condition, but they would not have any responsibility about the government. They would not be subject to scolding at every mouth by the officers above them, they would not find out what it is to be responsible for the government of others, and they would not be enjoying the education or partial education—or, rather, an education in partial self-government—which our system gives them. It adds to the expense and it does not give them so good a government, and therefore, if our policy were only the best for the time, I should yield to the criticism of Mr Ireland. But what we are trying to do is to teach these people by object lessons, as well as by direct education in the primary schools, what it is to be a free people.

The idea that freedom can be enjoyed by a people without learning how to enjoy it is something that belongs to theory, not to practice. It may be found in Boston, but nowhere else.

I ought to add that this system of government was most useful in bringing about peace, in satisfying the natives that we were there with the idea of giving them as much self-government as we could. Mr Ireland and the others who criticise ought in fairness, it seems to me, when they consider what is done there, to put themselves more or less in the position of those who had to do the job and to take into consideration those difficulties that present themselves on every side. We said that we were there for the benefit of the Filipino people; we said that we were there to give them as much of self-government as they could stand, and we did it. We may have given them a little more, but it is a good deal better to extend it a little beyond what they can stand and teach them the lesson and then say to them, "When you do educate yourselves up to this we will extend it a little more," as we have had occasion to do in a number of provinces, than it is to give them the impression that we were deceiving them in what we said we wished to do for them. One of the chief characteristics of the Orientals—indeed, one of the chief characteristics of all nations that are ignorant—is suspicion and distrust, and the primary rule of policy in dealing with them is absolute honesty and straightforwardness.

BUILDING ROADS

Now, Mr Ireland says that there is a woeful lack of improvements in the Philippines, especially in the matter of roads, and then he refers to the roads of the Roman Empire. Those roads have been made the basis for many an oratorical period, without knowledge as to how many years, how many decades, and how many centuries it took to construct them. But it is true that roads are a most important feature of civilization. Intercommunication is what helps, as much as education itself. We began our career as legislators in the Philippines by voting a million dollars to be expended by General McArthur in the construction of roads in the Philippines, and we have been trying to build them ever since. Well, there are 3,000 islands there. There are 140,000 square miles. A great many of the



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Young Filipinos

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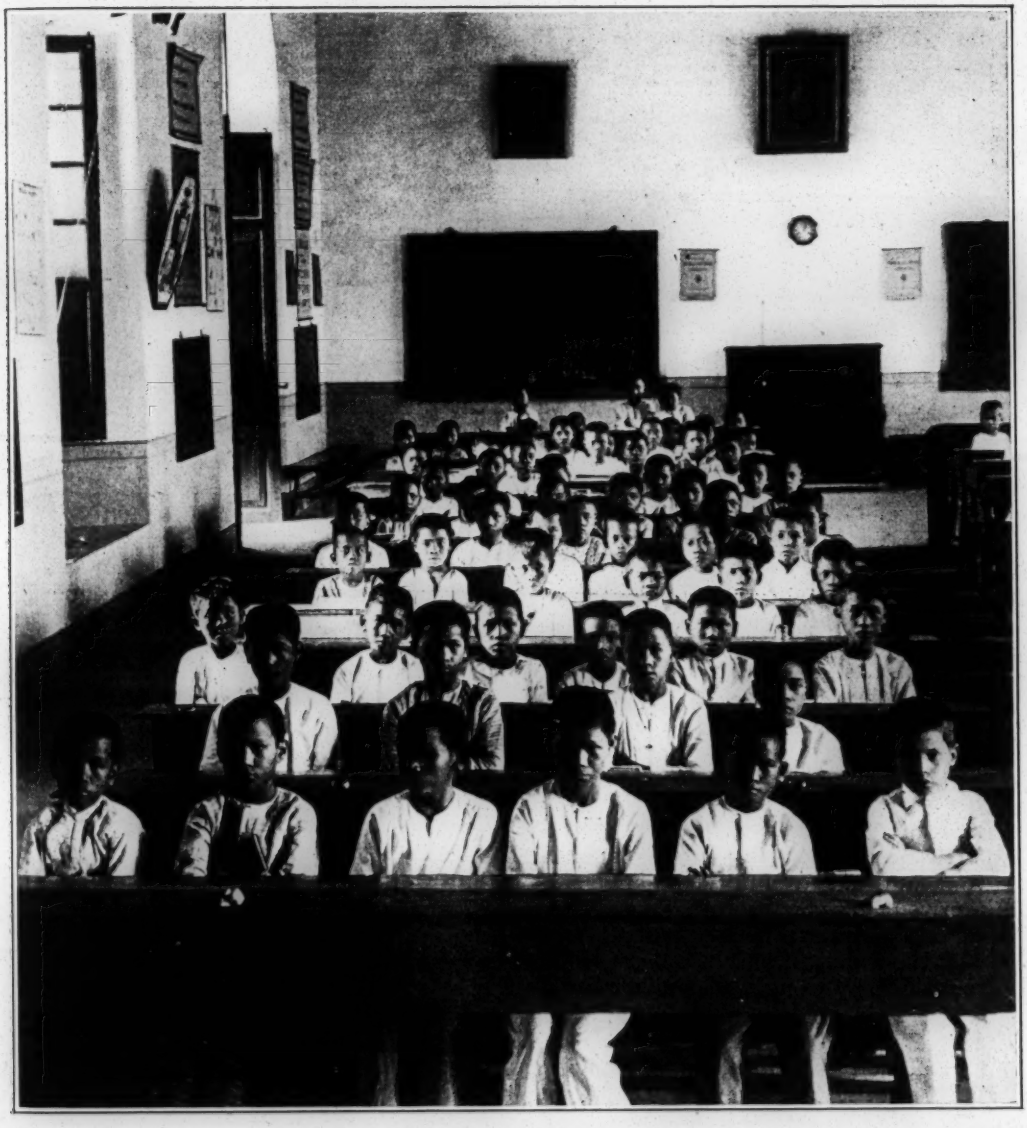
Primary Pupils in a Municipal School, Manila



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The Right Road to Filipino Freedom

Boys in the Normal High School, Manila

provinces lie in the low land, where there is no rock which can be used to be broken up and made good metal. They have to go into the bottom of the streams and get the gravel that comes down from the mountains and use that. And then we have, sometimes, six or eight months of torrential rains. You do not know what rains are, living here in the temperate zone. Think of 52 inches of rain in one month! That is what they have in the province of Benguet in the month of August.

And then take another feature of the civilization which we found there. It would seem as though Providence or nature were playing a joke. The roads are very hard to construct; but the natives, in order to make it still harder to preserve them, use wooden wheels for their carts and shave them down on the edge. They are solid wheels, and they shave them down to a knife edge, and then load the wagons and take them in this rainy weather over the roads. Well, the wheels cut as a razor would cut your finger, and this plays havoc with the roads. We attempted to cure that by imposing a fine of five dollars on every wagon that had a tire less than 2½ inches broad. But they concluded that this was only for taxation, and they paid the tax and continued to use the wagons. And then we had to import wagon wheels to show them what we meant, and we imposed a fine-and-imprisonment penalty for the use of the wagons with narrow-tired wheels.

Of the three millions of dollars which was voted by Congress part of it was expended in order to break up a corner in rice, which promised to be a rice famine, and two millions of it were spent in the construction of roads. Those roads are not all completed yet. You know that when you go through a tropical jungle with engineering instruments it is not so easy a matter as in this country, where you can see a long distance ahead, and the very work of laying out a road is a long one, taken with the difficulty of getting the material for making a permanent road. All road building must go slowly. Therefore when a gentleman goes along on an inspection tour in the *Princess Irene*, or one of those beautiful vessels of the Hamburg Steamship Company, and lands in India at Bombay, and drives out and sees those beautiful roads all through India, that have for 250 years been building, and then comes to Ceylon, where they have for so many years been building roads under the Dutch and English, and then comes to Singapore and into the Confederated Malay States, where they do not have any taxes, because they raise so much money out of the three-quarters of the tin product of the world that they get out of the mines there—they have been 50 years building roads—and then comes here to the poor Filipinos and finds that roads have not been constructed on every one of the 100 islands, and that the roads that have been constructed show signs of the previous year's torrential rains—it is a little difficult for a critic, however impartial, not to think that the government is very much to blame for not having constructed all those roads through all the islands as they ought to be, and as I hope some day they will be constructed, both for the peace of the islands and for the uplifting of the population. But meantime we are doing what we can.

NEW HARBORS, A PURE WATER SUPPLY, AND RAILWAYS

Well, to begin with, we have united Manila with every one of the 44 provinces by telegraph lines, and this is an opportunity for the spread of information and intercommunication. We have very good postal facilities. We have just opened 33 miles of street railway in Manila, and that a modern street railway. Manila, for its population, had more teams and more horses and vehi-

cles, I suppose, than any other city in the world. They were not very large horses and they were not very commodious vehicles, but such as they were they traversed the streets, and they were an absolute necessity, because everybody rides in Manila except the very poorest and humblest. In no other city in the world was a street-railway system more needed than in Manila, and I have no doubt that its presence there today—and it has begun both with great enthusiasm on the part of the people and on the part of the gentlemen who look forward to dividends from the franchise, given about a month ago—I have no doubt that the presence of that street railway will reduce the cost of living of the people of moderate incomes 25 per cent because of the absolute necessity of getting about and the opportunity of disposing of the horses and carriages and the necessity of feed and all the other expenses attendant upon the keeping of horses and carriages.

We are engaged in the expenditure of 6 millions of dollars in the harbors of Cebu, Manila, and Iloilo, and we shall probably have the best harbor in the Orient at Manila. People who are not familiar with the islands suppose that the Bay of Manila affords a harbor; but the Bay of Manila is 30 miles long and about 25 miles wide, with a 6-mile entrance at Corregidor which offers a full sweep to the southwestern monsoon, which comes in for six months in the year, which makes it impossible, especially in the afternoon, to land from boats that do not get behind a breakwater. This harbor is to be shut off from the wind by large breakwaters. It is very nearly completed. We are to have wharves, alongside of which the largest vessels can come, and, as I have said, 160 acres are to be reclaimed for the construction of warehouses and for business purposes of the city.

We are just putting in—just advertising the bonds for, have the plans for, and are just about to put in—a sewer system in Manila. Manila is about seven feet above the ocean—it does go up to about 10 feet—and you cannot sink a hole anywhere without striking water within 3 or 4 feet. That makes the problem of sewerage very difficult, and we have a plan now which involves the pumping of the sewerage away out to sea, so as to rid the city of any danger from it. Mr Desmond Fitzgerald, of Boston, whom we sent for as an expert engineer, has pronounced the plans to be correct.

We have had to go back into the mountains about fifteen miles in order to increase the water supply of Manila and to be sure that we shall get above the region where the water would be impregnated with cholera germs or other undesirable inhabitants. This will cost about two millions of dollars, but we are just now ready to construct it.

We are engaged, under an act of Congress recently passed, in preparing invitations to bid for the construction of a thousand miles of railway in the islands. When we have the thousand miles of railway constructed, so as to open each island to the sea, we shall proceed much more rapidly in the construction of wagon roads, because then we shall have some means by which we can haul road material from one point to another. I would like to dwell on the subject of the railways, but I have not time.

PHILIPPINE CIVIL SERVICE

Mr Ireland criticises, in some detail, the civil service of the islands. Well, I was a civil-service reformer when I went to the islands, and I was determined that we should put in force there as strict civil-service rules on the basis of civil-service reform here as we could, and we did; and nobody can get into the service there now without first passing an examination. But Mr Ireland says that the examination is only up to the standard of the ordinary high-school

examination, and he compares it with the examination that a man has to pass to enter the colonial service of Hongkong, China, or Calcutta, India. That is an examination, I should judge from what he says, equal to that a man must pass when he gets the degree of "A. B." at Harvard or Yale. Well, I said to Mr Ireland that if that were the kind of examination we had to put a man through we would not have anybody in the government service of the islands. That is all right for a country that has been 250 years in colonial government, with such a lot of sons anxious to go out somewhere and fit themselves for the service; that has been in the business long enough to establish schools and universities in England, where they directly fit people for the service, and that has been sufficiently long in the colonial service to establish a service where you have a pension, and where a man may look to that service as the service of his life, and as a place from which, at the very reasonable age of sixty or sixty-two years, he may retire on his pension knowing that he and his family will be taken care of. Now, it is possible to get men under such circumstances; and no one has a more profound admiration for the colonial service of England than I have. I know that it is an admirable service, and I wish that we, too, could have such a service; but the idea of talking about our having such a service when we have been in the islands three years, and that we could have a university education as a basis for a complete civil service seems to me to indicate that our brother Ireland shot too far. He did not know how "to restrain himself," as Lord Coke said, "to the fitness of the thing."

IF WE INTRODUCE CHINESE WE WILL HAVE A REVOLUTION

Now, the next issue that Mr Ireland makes is a very serious one—one, I agree, upon which strong arguments can be made upon both sides—and that is the question as to whether we should admit Chinese laborers to the islands to build them up. Mr Ireland says that we have no laborers in the islands worthy of the name, and that if we expect to do anything there we might as well at once admit the Chinese; that they would build up the islands, and that it would be for the benefit of the Filipinos. But I do not think that Mr Ireland looked at the result of that policy as he saw it exhibited at Singapore and in the Straits Settlements, with a full consideration of what it meant to the Malays, who were there before they admitted the Chinese, for he found that all the business and all the work and all the money and all the influence and everything that was worth having was Chinese. There is a superficial appearance of English in the government, but the money and the work and the business are largely Chinese, and our friends the Malays sit around in the park and enjoy the sight. They are relegated to the back bench. Now, then, that is certain to be the case if we admit the Chinese to the Philippines, and the question is whether under our promise to them to govern the Philippines for the benefit of the Filipinos we can afford to bring about a condition in which the Filipinos shall be relegated to the back seat and the Chinamen shall be invited forward to share all the benefit that may come from the development of the rich country.

Another reason why we cannot do it is because if we do we will have a revolution. There is the deepest feeling possible against the admission of Chinese into those islands. There are today about 50,000 of them in the islands, if not more. The reason why the Filipinos do not like the Chinese is this: A Chinaman will come into the islands and he will work for twelve or fifteen dollars (silver) a month—that is, six dollars or six dollars and a half a month. He will save out of that about ten dol-

lars (gold) a month. He does that in some way. I do not know how he does it. He will live there a year, and at the end of that year he will go out of the laboring business and he will set up a store next to a Filipino woman, who is the man of the concern ordinarily and who is the business person of the community among the Filipinos. He will drive that woman out of business within six months. That is the reason why the Filipinos do not like the Chinese there, and that is the reason why, in the history of the islands, if you will go back, there has been massacre after massacre of Chinamen. It would seem, therefore, an unwise political move. But if the development of the country without the admission of Chinamen is impossible, possibly we ought to run the risk of both. Well, now, is it? Mr Ireland says that it is. We have let this very large public work, which will cost from four to five millions of dollars—the construction of the Manila harbor works. We let it, after advertising, to the Atlantic and Pacific Gulf Company of the United States. Mr Mullen was at the head of it, and he came out and looked around. He said that he did not think that the Filipinos were good for anything, and that he would employ Americans and Chinamen and any one else he could get. There are only 50,000 Chinamen in the islands, and they know that no more can come there and they know that that increases their value, and that that makes them more desirable, and then they become less useful, so that they do not make as good laborers in the Philippines as they do at home, where they have to scramble for a living.

MR KRUSI'S METHOD OF GETTING GOOD LABORERS

A gentleman by the name of Mr Krusi came out as vice-president of the company, and he concluded that he would make a different experiment. The company had a big quarry from which they had to take the stone to construct the breakwater. Mr Krusi built a house. You know they can build a house there—such a house as they live in there—constructed of bamboo and nipa palm. The floors are made of split bamboo, and so the floor serves the purpose of both the bed and the floor, and you can see through to the ground 4 or 5 feet below it. Everything is airy and comfortable. Now, that is the kind of house he built for each family. He had a theater, he had a church, he had a school-house, he had actresses, he had a priest, he had a teacher, he had a cockpit, he had a band. The band played every evening, the cockpit was open on fiesta days, the theater was open three times a week, the church was open all the time. Before three months had passed he had 1,500 laborers there, and he had to call the police to keep others away who were trying to get work there. He says that he has never had better labor than he has had in his quarry. He had to employ from 5 to 8 per cent of American foremen—that is, men who would go in—not gentlemen foremen, but men he sent in to help to do the work—to show the men how the work was to be done. He said that he had no trouble whatever, and that the work was much better than it was before.

Well, now, another example: The street railway has just been constructed—33 miles of it—and they have had from 1,000 to 1,200 men at work, and they have constructed the street railway in Manila at a less cost per mile than they could have built it in Washington or New York. That shows that the cost per unit of product of labor is less with the Filipino laborer. So it has been the case with the government works; but it was supposed that because the government paid a little more than the rest that it could get better labor. Now, it is quite possible in this instance, being in and about the city, that they got the benefit of the best

labor, and it is quite possible that when you go into the country you will find more trouble in congregating labor; but those instances are enough to demonstrate that Filipino labor is possible of training; that what is wanted is wages enough to attract them and training enough to make them effective; and so, with due respect to Mr Ireland, with considerable personal experience in the matter, I am confident that Filipino labor is capable of development, and that while the islands may develop more slowly with Filipino labor, they will develop much more to the advantage of the Philippine people than if we should admit the Chinamen.

IS OUR GOVERNMENT TOO EXPENSIVE?

And now a serious charge that is made against the government is that it is expensive; and Mr Ireland figures out that whereas Ceylon, Trinidad, the Straits Settlements, and Burma cost only about 27 per cent of the total exports, the cost in the Philippines is 46 per cent. I agree that the cost of the government, under the circumstances, is very heavy. It must be taken into consideration, first, that this proportion is made larger by the exports because of the deficiency of railways in the islands. In those other colonies to which reference is made the proportion of railways to the area is very much greater than in the Philippine Islands. In the Philippines there is only one line of railway, 120 miles in length; so that when we introduce railways 1,000 miles in length we may suppose that the exports will become greater, and that the proportion of the exports will be very much reduced.

But I wish also to call attention to the fact that we have been going only three years; that we have been until three years in a state of war; that our education is 10 per cent of the exports; that our constabulary necessary to restrain disturbed conditions is 6 per cent. Now, the education of these other countries was considerably less than 1 per cent. That we have had because we have so many to control, to build up an island navy which cost us nearly three millions of dollars and costs us upward of six or seven hundred thousand dollars a year to run; that since we have been there we have had a terrible scourge of cholera, which necessitated the expenditure in the health department of a million dollars; that we had the rinderpest, that carried away 90 per cent of our draft animals and reduced the business of producing for the purposes of export.

Now, all these things Brother Ireland does not consider at all in his comparison between these countries of Ceylon, Trinidad, the Straits Settlements, and Burma, all of which have been prosperous, and the Straits Settlements, as I have said, receiving all its income from tin and opium.

I agree that we have too many Americans in the government. You cannot get an American to go 10,000 miles away from home without paying him something and paying him much more than you would pay a Filipino for doing the same work, and we must expect to reduce the number of Americans as the government goes on, and by reducing the number of Americans reducing the total expenditure, because in getting a Filipino who will do the same work as an American you ought to be able to get him for half the price.

Then Mr Ireland criticises severely the treatment of the islands by this country with respect to the tariff, and in that respect I fully concur with him. I sincerely hope that next year Congress will reduce the tariff to nothing on all goods produced in the Philippine Islands, except tobacco and sugar, and reduce that to 25 per cent, merely to justify our putting a duty in the Philippines against you until 1909, in order that the government may be supported and not lose

that revenue until that time. And then when 1909 comes, and we are released from the necessity under the treaty of Paris from giving the same privileges to Spain as to the United States, then we can have complete free trade between the islands and America. It is true, as Mr Ireland says, that the Philippines are less developed than any of the colonies to which he refers. It is true that, in a certain sense, the people are less educated. It is true that they are more like children. But it is not true that they are not the best material for self-government. It is true that those islands, the gems of the Orient, have been undeveloped in a way that it is hard to understand unless you read the history of the islands, and then you see that these people were brought up to be children constantly, in order that they might not know the wickedness of the world, and that all development was restrained. Now, may we not hope that under American influence, which shall tend to uplift the islands and at the same time to invest good American and other capital there for the purpose of introducing railways and developing the wealth of these islands that there is in the soil, in the mines, in the forests—may we not hope that in 40 years hence, when Brother Ireland goes around the world again to compare the various civilizations, that a new light will break in on him when he looks at the islands?

FORESTRY ABROAD AND AT HOME*

BY GIFFORD PINCHOT

CHIEF OF THE BUREAU OF FORESTRY

EXCEPT China, all civilized nations care for the forest. Until recently the United States ranked nearly with China in this respect, and our country still remains far behind the progressive modern nations in nearly all that relates to the protection, preservation, and conservative use of the forest. Japan has a well developed forest service and a national forest school. In Austria, Italy, and Norway and Sweden government forestry is a well-established portion of the national life. Turkey, Greece, Spain, and Portugal give attention to the forests. Russia, dealing like ourselves with vast areas of forests in thinly peopled regions, but by methods wholly different from our own, is drawing enormous revenues from the systematic care and use of the forests. In Germany the scientific treatment of forests has reached perhaps its highest development. The foresters of France have perfected a most practical and effective general system of forestry, and have created the difficult art of controlling the floods of mountain torrents by planting trees. The Republic of Switzerland, by the use of methods most instructive to citizens of the United States, has developed a type of government forest policy more worthy of our attention and imitation than any other in Europe. In Australia and New Zealand forestry has already made important advances. In Canada the English have made real progress in forestry. The government sells the timber from its forests, but retains possession of the lands and employs fire guards. At the Cape of Good Hope they have an excellent forest service;

*A chapter from a "Primer of Forestry," part II, by Mr Pinchot, recently published by the Department of Agriculture.

From Gifford Pinchot, Forester

An Exceedingly Productive Spruce Forest in Bavaria

in British India they have met and answered many questions which still confront the American forester, and in a little more than thirty years have created a forest service of great merit and high achievement. The United States has scarcely yet begun.

THE FOREST IN EARLY TIMES

In very early times the forest was preserved for the game it contained. Forestry then meant the art of hunting, and had very little to do with the care of trees. Even the word forest, which really comes from the Latin *foris*, meaning out of doors, was thought in England to be derived from the fact that it was a place given up to wild animals *for rest*. But gradually the forest came to be considered more than the game, and the serious study of forestry began.

MODERN FORESTRY

Forestry as a science is of comparatively recent origin, although a work in which all the European trees are described was one of the earliest printed books. Until the end of the eighteenth century forestry was discussed chiefly by men who were either scholars or practical woodsmen, but who were not both. Then appeared Hartig and Cotta, two men who united these points of view, and their writings are at the base of the whole modern growth of the subject. Both were German. Each cov-

ered the whole field as it was then understood, and together they exerted an influence which has not been approached by any other authors since. From Germany their teaching spread to France, and early in the nineteenth century their doctrines were introduced into the French Forest School at Nancy by Lorentz, who, with his successor, Parade, was the founder of modern forestry in France.

Under the feudal system, which was finally destroyed in France by the revolution of 1789, the forest was the property of the feudal lord. In order to make the life of their serfs, who were useful both as taxpayers and as fighting men, easier, and so increase their number, he gave them the privilege of taking from his forest the wood which they required. For similar reasons the wealthy religious houses, like that of the Grande Chartreuse, made grants of land and of rights in the forest. But after a time the number of peasants increased so much that their wants absorbed nearly the whole produce of the woodlands. Then it was found necessary to limit the prescriptive rights to forest product by restricting them to certain parts of the forest, or to make an end of them by exchanging them for the absolute ownership of smaller areas. Thus many of the communities, to which, and not to individual peasants, these rights belonged, came to possess forests of their own. But the communes, as they were called, managed their forests badly, and about three hundred years ago the government was forced to intervene. Under the management of officers of the government forest service the results from the communal forests have been excellent. At present these forests not only supply fuel to the villages which own them, but in some cases they produce enough to pay all the village taxes as well.

GERMANY

Germany still holds the high position in forest science, which began with Hartig and Cotta. The German forest schools, of which there are seven of the higher grades, are still among the very best, and the study of forestry, both in the schools and in the forest experiment stations, is eagerly pursued. The forests in Prussia, Saxony, and other German states are admirably managed and yield important returns. The total value of the German forests, public and private, is said to be about $4,500,000,000.

FRANCE

Forestry in France has long been associated with the names of famous men. Henry of Navarre and his friend and minister, Sully; Palissy, the great potter, who called the neglect of the forest prevalent in his time "not a mistake, but a calamity and a curse for France;" Colbert, the minister of Louis XIV; the botanist Duhamel du Monceau; Buffon, the celebrated naturalist, are among the men to whom France owes the rise and progress of her present excellent forest policy. Their peculiar service was to lay the foundation, both in law and in public opinion, upon which modern forestry in France now rests.

The forests of the French government are admirably managed. They cover only about 2,750,000 acres, but they yield a net return each year of more than $2 per acre. Besides handling their natural forests with great intelligence and success, the French foresters have done much for the general progress of forestry. They developed the art of reforesting denuded mountains, and were the first to plant trees on moving sand dunes along the seashore. More than 150,000 acres of these dunes, which once were blown about by the wind until they overwhelmed great stretches of fertile ground, and even threatened to bury whole towns, are now covered with forests of pine, which produce great

quantities of turpentine, lumber, and charcoal.

SWITZERLAND

In Switzerland forestry received attention from very early times. Nearly two hundred years before the discovery of America the city of Zurich began to make rules for the protection and management of the Sihlwald, a forest which it still owns, and which now yields an annual return of about $8 per acre. In the canton of Bern a decree of the year 1592 warned the people against the wasteful use of timber and provided for the protection of the forest. It also directed that for every tree cut down a young one should be planted in its place. It is curious to find this mistaken prescription for the ills of the forest already in fashion more than three centuries ago. To save the forest every old tree must be replaced by *many* young ones.

The first general forest law of Bern was passed as early as 1725. It embodied the most important principles of wise forest legislation as we know them today. But this was only one of a long series of forest laws in which, from the beginning, the idea of the importance of the forest to others besides its owner became steadily stronger. The citizens of Bern have grown ever more willing to place restrictions on themselves for the benefit of the commonwealth.

There were great floods in Switzerland in 1834, and they were the cause of a general awakening of interest in forestry. Somewhat later a federal forest commission was appointed. Since the appearance of its final report, in 1861, the progress of forestry in Switzerland has been steady. In 1875 a federal forest inspector was appointed, and a year later the first Swiss forest law was passed. This law does not extend to the whole of Switzerland, but only to the Alps and the steeper foothills. In a country of steep mountains it is of first importance to guard the forests on the higher slopes. Consequently all the forests on these higher lands which serve to protect the lowlands against floods, avalanches, and other similar dangers of wind and weather are put in charge of the Swiss federal forest service.

"Our forest laws," said Elias Landolt, a great and simple man, whose name stands first among Swiss foresters, "are intended to work more thorough instruction, good example, and encouragement than by severe regulations. This method is somewhat slower than one which should involve harsher measures, but the results achieved are more useful and lasting. When forest owners do something because they are convinced of its usefulness it is done well and with an eye to the future, but what they do under compulsion is done carelessly and neglected at the first opportunity. What they have come to learn in this way and have recognized as good will be carried out, and that better and better from year to year."

BRITISH INDIA

For many years after the British conquest forestry in India made very little progress. Much time was wasted in half measures, until in 1856 Dr (now Sir Dietrich) Brandis was put in charge of the teak forests of Pegu. He acted at once upon the idea of preserving them by making them pay. At first the output of teak had to be somewhat restricted, much against the will of the timber merchants of Rangoon, who protested that the business of their city would be ruined. But after this momentary check the teak trade of Rangoon grew until it was far greater than ever before, and it is now a chief and increasing source of the prosperity of that city.

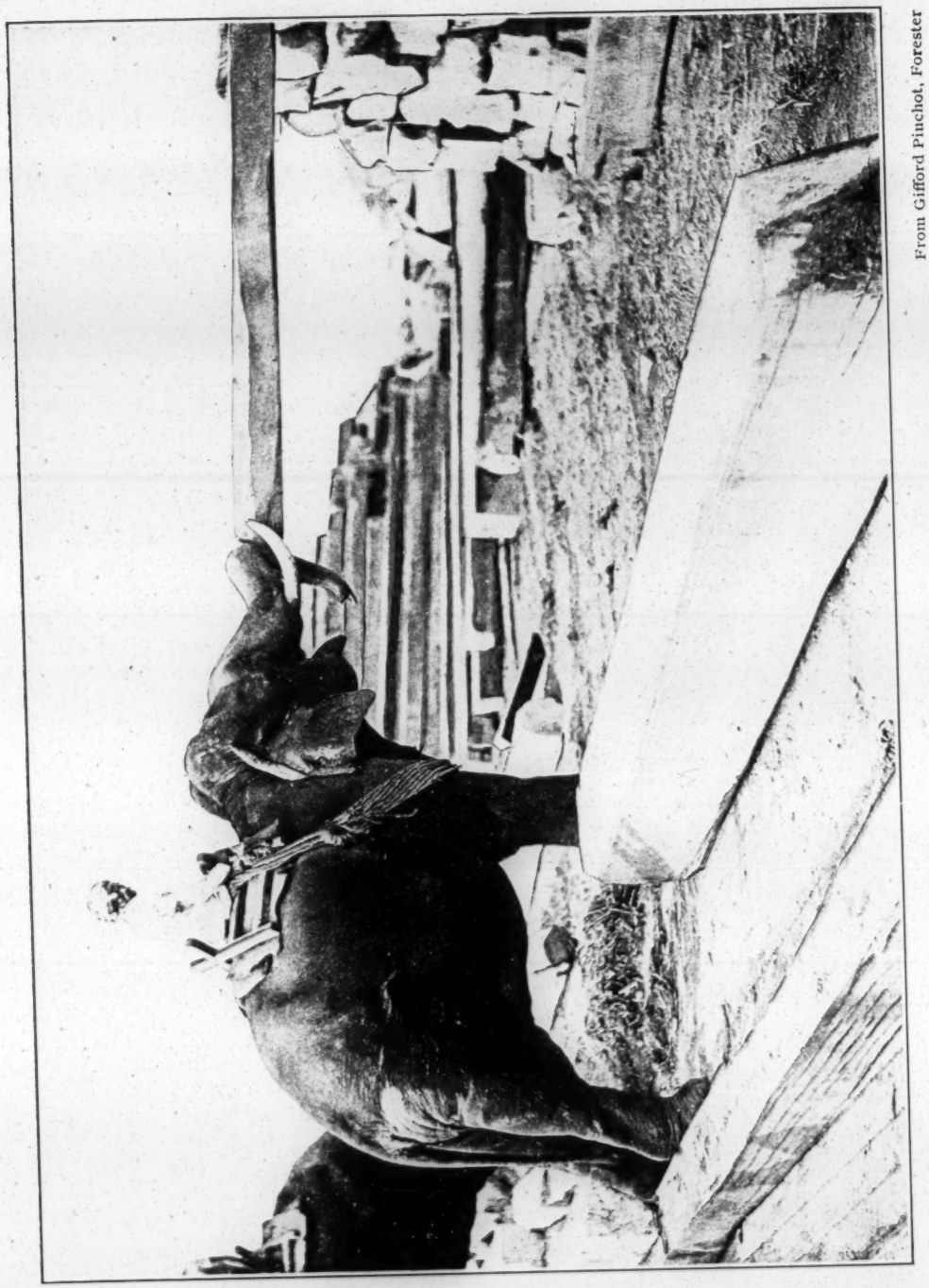
The appointment of Dr Brandis was the beginning of the Indian forest service. In 1866 he was made inspector general of forests, and from that time progress was rapid. The Indian forest

From Gifford Pinchot, Forester

Elephants Used for Dragging Logs in the Forests of Burma

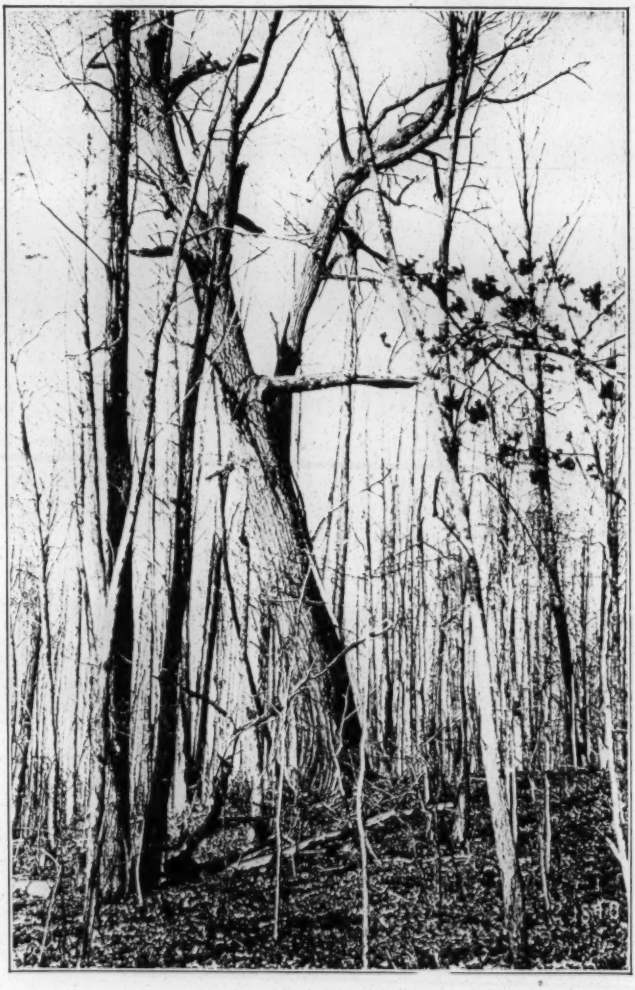
From Gifford Pinchot, Forester

Piling Timber in the Lumber Yards of Burma



From Gifford Pinchot, Forester

Piling Timber in the Lumber Yards of Burma



From Gifford Pinchot, Forester

A Mixed Forest in Need of an Improvement Cutting

The crooked old chestnut in particular should be removed

service now has nearly 300 superior officers and over 10,000 rangers and forest guards. It has charge of about 200,000 square miles of forest, and produces a net revenue, after all expenses have been paid, of about $3,000,000 a year. In addition, the forests furnish to peasant holders of forest rights products whose value is estimated to be considerably greater than the whole cost of the forest service. About 30,000 square miles are effectively protected against fire, at an average yearly cost of less than half a cent per acre. These admirable results are especially interesting because India is like the United States in the great

From Gifford Pinchot, Forester

A Mixed Forest After an Improvement Cutting

extent and variety of her forests and in the number and fierceness of forest fires.

FORESTRY AT HOME

The forests of the United States cover an area of about 699,500,000 acres, or more than 35 per cent of the surface of the country. Before so large a part of them was destroyed they were perhaps the richest on the earth, and with proper care they are capable of being so again. Their power of reproduction is exceedingly good.

In the northeastern states and as far west as Minnesota once stretched the great white-pine forest from which, since settlement began, the greater part of our lumber has come. South of it,

From Gifford Pinchot, Forester

Conservative Lumbering in the Adirondack Mountains, New York

Note the height of the stump

in a broad belt along the Atlantic and the Gulf coasts, lies the southern pine forests, whose most important tree, both for lumber and naval stores, is the southern yellow pine. In the Mississippi Valley lies the interior hardwood forest of oaks, hickories, ashes, gums, and other hardwood trees. It is bordered on the west by the plains, which cover the eastern slope of the continental divide until they meet the evergreen Rocky Mountain forest, which clothes the slopes of this great range from the Canadian line to Mexico. Separated

From Gifford Pinchot, Forester

Wasteful Lumbering on the Pacific Slope

Note the height of the stump

from the Rocky Mountain forest by the interior deserts, the Pacific Coast forest covers the flanks of the Sierras, the Cascades, and the coast ranges. Its largest trees are the giant sequoia and the great coast redwood, and its most important timber is the fir.

The forests of the Philippine Islands cover an area of more than 40,000,000 acres. Their timbers, almost wholly different from those of the United States, are exceedingly valuable, both as cabinet woods and as construction timber. An efficient forest service was organ-

ized in 1898, and following its reorganization in 1902 a new and excellent forest law was passed in 1904. The Philippine forest service costs but half as much as the revenue received from the forests of the islands.

The island of Porto Rico contains a national forest reserve, the site of which was once covered with valuable hardwoods; but this forest has been much abused. Porto Rico, like the Philippines, has many kinds of wood valuable for cabinet-making.

THE SETTLER AND THE FOREST

When the early settlers from the Old World landed on the Atlantic coast of North America they brought with them traditions of respect for the forest created by generations of forest protection at home. The country to which they came was covered, for the most part, with dense forests. There was so little open land that ground had to be cleared for the plow. It is true that the forest gave the pioneers shelter and fuel and game for food, but it was often filled with hostile Indians; it hemmed them in on every side, and immense labor was required to win from it the soil in which to raise their necessary crops. Naturally, it seemed to them an enemy rather than a friend. Their respect for it dwindled and disappeared, and its place was taken by hate and fear.

The feeling of hostility to the forest which grew up among the early settlers continued and increased among their descendants long after all reason for it had disappeared. But even in the early days far-sighted men began to consider the safety of the forest. In 1653 the authorities of Charlestown, in Massachusetts, forbade the cutting of timber on the town lands without permission from the selectmen, and in 1689 the neighboring town of Malden fixed a penalty of 5 shillings for cutting trees less than 1 foot in diameter for fuel. An ordinance of William Penn, made in 1681, required that 1 acre of land be left covered with trees for every 5 acres cleared. But these measures were not well followed up, and the needless destruction of the forest went steadily on.

FIRST STEPS IN FORESTRY

More than a hundred years later, in 1795, a committee of the Society for the Promotion of Agriculture, Arts, and Manufactures in New York made a report on the best way to preserve and increase the growth of timber. Four years afterward Congress appropriated $200,000 for the purchase and preservation of timberlands to supply ship timbers for the Navy, and in 1822, with the same object in view, it authorized the President to employ the Army and Navy to protect and preserve the live-oak and red cedar timber of the government in Florida. Since that time more and more attention has been given to the forests. In 1828 Governor De Witt Clinton, of New York, spoke of the reproduction of our woods as an object of primary importance, and in the same year the government began an attempt to cultivate live oak in the South for the use of the Navy. Three years later an act was passed which is still almost the only protection for the much-abused forests of the public domain.

In 1872 the Yellowstone National Park was established, and in 1873 Congress passed the timber-culture act, which gave government land in the treeless regions to whoever would plant one-fourth of his claim with trees. In 1875 the American Forestry Association was formed in Chicago through the efforts of Dr John A. Warder, who was one of the first men to agitate forest questions in the United States. In the centennial year (1876) Dr Franklin B. Hough, perhaps the foremost pioneer of forestry in America, was appointed special agent in the Department of Agriculture. This was the beginning of educational work in forestry at Washington. Soon after-

ward Congress began to make appropriations to protect the public timber, but nothing was done to introduce conservative forest management. The present Bureau of Forestry in the Department of Agriculture was established as a division in 1881.

About this time forest associations began to be established in the different states, the most influential and effective of which has been that in Pennsylvania. The states also began to form forest boards or commissions of their own.

In 1888 the first forest bill was introduced in Congress. It failed to pass, but in 1891 an act was passed which was the first step toward a true policy for the forests of the nation. The first step toward national forestry is control of the national forests. This act, whose chief purpose was to repeal the timber-culture act, contained a clause which authorized the President to reserve timberlands on the public domain, and so prevent them from passing out of the possession of the government.

THE PUBLIC DOMAIN

In all the states and territories west of the Mississippi except Texas, and in Ohio, Indiana, Illinois, Michigan, Wisconsin, Florida, Alabama, and Mississippi, all the land originally belonged to the government. This was the public domain. It has gradually been sold or given away until in many of the states it has all or nearly all passed to other owners. But it still includes more than 470,000,000 acres, or nearly one-third of the United States, not including the territory of Alaska, which has an area of about 350,000,000 acres. A large part of the public domain has been surveyed by the government and divided first into squares 6 miles on each side, called townships, then into squares of 1 mile, called sections, and these again into quarter sections and smaller divisions. The lines which mark these divisions are straight and at right angles to each other. When any part of the public domain is reserved or disposed of it is usually located by reference to these lines.

FEDERAL FOREST RESERVES

When the President was given the power to make forest reserves the public domain still contained much of the best timber in the West, but it was passing rapidly into private hands. Acting upon the wise principle that forests whose preservation is necessary for the general welfare should remain in government control, President Harrison created the first forest reserves. President Cleveland followed his example. But there was yet no systematic plan for the making or management of the reserves, which at that time were altogether without protection by the government. Toward the end of President Cleveland's second administration, therefore, the National Academy of Sciences was asked to appoint a commission to examine the national forest lands and report a plan for their control. The academy did so, and upon the recommendation of the National Forest Commission, so appointed, President Cleveland doubled the reserved area by setting aside 13 additional forest reserves on Washington's birthday, 1897.

EARLY OPPOSITION TO FOREST RESERVES DISAPPEARING

The Cleveland forest reserves awakened at once great opposition in Congress and throughout the West, and led to a general discussion of the forest policy. But after several years of controversy widespread approval took the place of opposition, and at present the value of the forest reserves is rarely disputed except by private interests impatient of restraint.

The recommendations of the National Forest Commission for the management of the forest reserves were not acted upon by Congress, but the law of June

4, 1897, gave the Secretary of the Interior authority to protect the reserves and make them useful. The passage of this law was the first step toward a national forest service. The second step was the act of Congress, approved February 1, 1905, which transferred the control of the national forest reserves from the Department of the Interior to the Department of Agriculture. This act consolidated the government's forest work, which had been divided between the General Land Office and the Bureau of Forestry, and secured for the reserves the supervision of trained foresters.

President McKinley, and after him President Roosevelt, continued to make forest reserves. The latter introduced a system of examining the proposed forest reserves, so that now their boundaries are better located than ever before. Under him great progress has been made by the government in bringing about the practice of forestry by forest owners and in awakening the great lumber interests, as well as the people in general, to the dangers of forest destruction.

USE OF FOREST RESERVES

The forest reserves lie chiefly in high mountain regions. They are 62 in number, and cover an area (January 1, 1905) of 63,308,319 acres. They are useful, first of all, to protect the drainage basins of streams used for irrigation, and especially the watersheds of the great irrigation works which the government is constructing under the reclamation law, which was passed in 1902. This is their most important use. Secondly, they supply grass and other forage for many thousands of grazing animals during the summer, when the lower ranges on the plains and deserts are barren and dry. Lastly, they furnish a permanent supply of wood for the use of settlers, miners, lumbermen, and other citizens. This is at present the least important use of the reserves, but it will be of greater consequence hereafter. The best way for the government to promote each of these three great uses is to protect the forest reserves from fire. The forest service plans to add a trained forester to the executive force of each forest reserve to introduce practical forestry on all reserves.

STATE FORESTRY

Many of the states have taken great and effective interest in forestry. Among those which have made most progress are New York and Pennsylvania. New York has a state forest preserve of 1,436,686 acres, and Pennsylvania one of 700,000. Michigan, Minnesota, and other states are following their example.

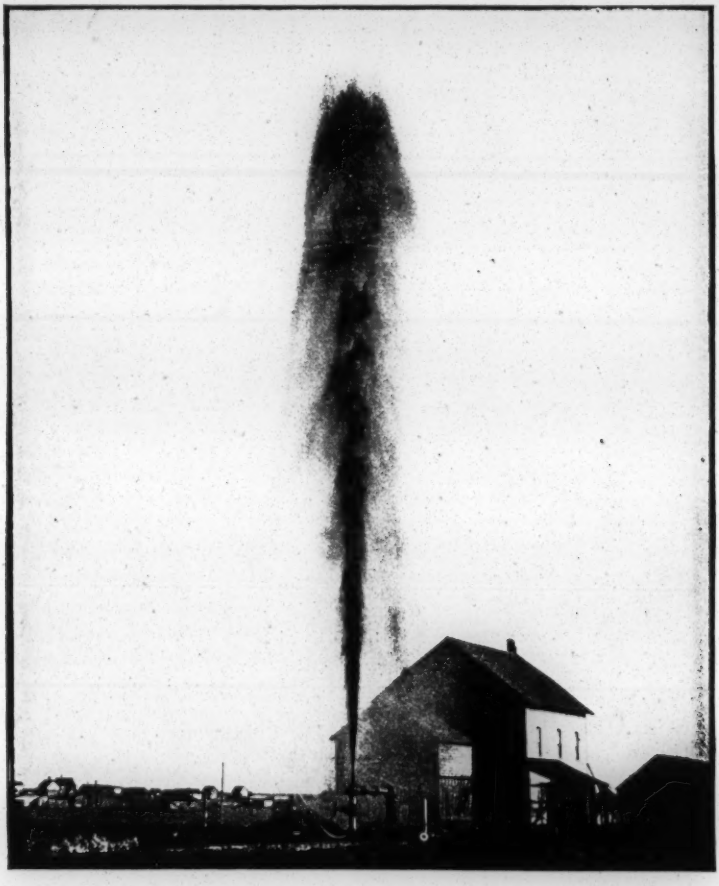
In 1892 the first example of systematic forestry in the United States was begun at Biltmore, in North Carolina. It is still in successful operation.

The first professional foresters in the United States were obliged to go abroad for their training, but in 1898 professional forest schools were established at Cornell University, in New York, and at Biltmore, in North Carolina, and they were followed by the Yale Forest School in 1900. Others have sprung up since. At present thorough and efficient training in professional forestry can be had in the United States.

THE CENTRAL GREAT PLAINS

THE United States Geological Survey has for a number of years been studying the underground waters which are flowing hundreds of feet beneath the surface in many sections of the Central Great Plains, including the greater portions of South Dakota, Nebraska, and Kansas and the eastern portion of Colorado and of Wyoming, an area of about one-half million square miles. In order that we may make the best possible use of the underground "rivers" which it it is believed flow perhaps continuously for some hundreds of miles, it is necessary to understand the structure and stratigraphy of the water-bearing formations.

The question of water supply, both overground and underground, is one of great interest to the people in this district, and although considerable progress



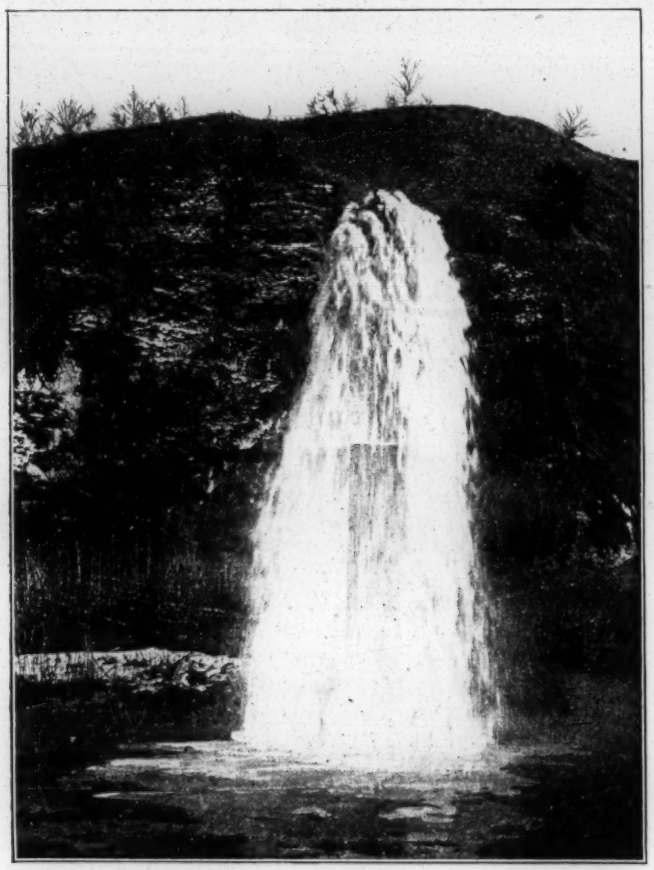
From N. H. Darton, U. S. Geological Survey

Artesian Well at Woonsocket, South Dakota

This well throws a 3-inch stream to a height of 97 feet

has been made in some sections in developing well waters, there are vast areas in which the present supplies are inadequate, even for local domestic use.

The investigation has been in charge of Mr N. H. Darton, who has recently brought together the results of the work in a handsome quarto volume of 400 pages published by the Survey, and entitled "Geology and Underground Water Resources of the Central Great Plains." Mr Darton gives an excellent geologic history of the region, describing not only those sections which conceal water far down in the earth, but also those places which are dry below as well as above.



From N. H. Darton, U. S. Geological Survey

Artesian Well at Lynch, Nebraska

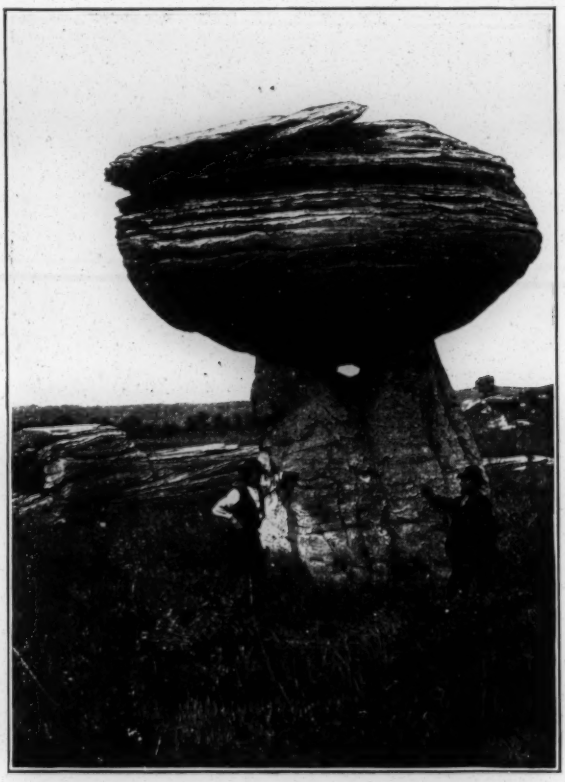
This well has a flow of 3,100 gallons a minute from an 8-inch casing, with a pressure of 85 pounds to the square inch. A first flow was found at 740 feet and a second at 875 feet

Smooth surfaces and eastward-sloping rolling plains are the characteristic features of the region, but in portions of the province there are buttes, extended escarpments, and local areas of badlands.

The report reproduces more than one hundred beautiful photographs by Mr Darton of different scenes in the Great Plains. Several of these are given here. The thick succession of sedimentary formations underlying the Great Plains includes porous strata containing large volumes of water. These water-bearing deposits comprise widespread sheets of sandstones or sand, from Cambrian to Tertiary in age. The sandstones of the older formations are in sheets often several hundred feet thick, alternating with bodies of relatively impermeable shales or limestones, so that they present favorable conditions as water-bearers. To the west they are upturned by the great uplifts and outcrop along the high mountain slopes; to the east most of them rise gradually to the surface, while in the central and northern regions they lie at great depth under the heavy mantle of younger deposits.

Part of the surface water passes into the sandstones in their elevated outcrop zones along the foot of the western mountains and flows east through the permeable rocks, in most cases finally escaping in springs in the low-level areas of outcrop eastward and southward. In such water-bearing strata as the Dakota and underlying beds, which are overlain by a thick mass of impermeable deposits, the waters are under great pressure, for the intake zone has an altitude of from 4,000 to 6,000 feet and the region of outflow is only from 1,000 to 1,200 feet above sea-level. The existence of this pressure, as found in many wells in eastern South Dakota, is the strongest evidence we possess that the waters flow underground for many hundreds of miles. Several wells show surface pressures over 175 pounds to the square inch and two are slightly over 200 pounds, the latter indicating a pressure of 780 pounds at the bottom of the well. In South Dakota the Dakota sandstone carries a large volume of water, which has been extensively utilized by artesian wells. This water is under pressure so great that in the eastern portion of the state flows are obtainable in all but the very highest lands, except in the southeast corner, near the zone, where the head is lost by the sandstone reaching the surface. Over a thousand deep wells have been sunk east of the Missouri River, most of which are from 500 to 1,000 feet in depth and generally yield a large supply of flowing water, much of which is used for irrigation. The aggregate flow from these wells is estimated to be about 7,000,000 gallons a day.

The illustration on page 389 shows a remarkable well. Another phenomenal well in the same state is a well at Springfield, which has a flow of 3,292 gallons per minute, although its closed pressure is not so great as that of many other wells in the state. It furnishes power for a 60-barrel flour mill by day and for an electric-light plant by night. For a while it threw sand, and when this finally ceased the flow was thought to have slightly decreased.



From N. H. Darton, U. S. Geological Survey

Pulpit Rock, Kansas

An outcrop of Dakota sandstone

It is believed by some persons that owing to this great draft upon the resources the available supply is diminishing, but there is as yet no valid evi-

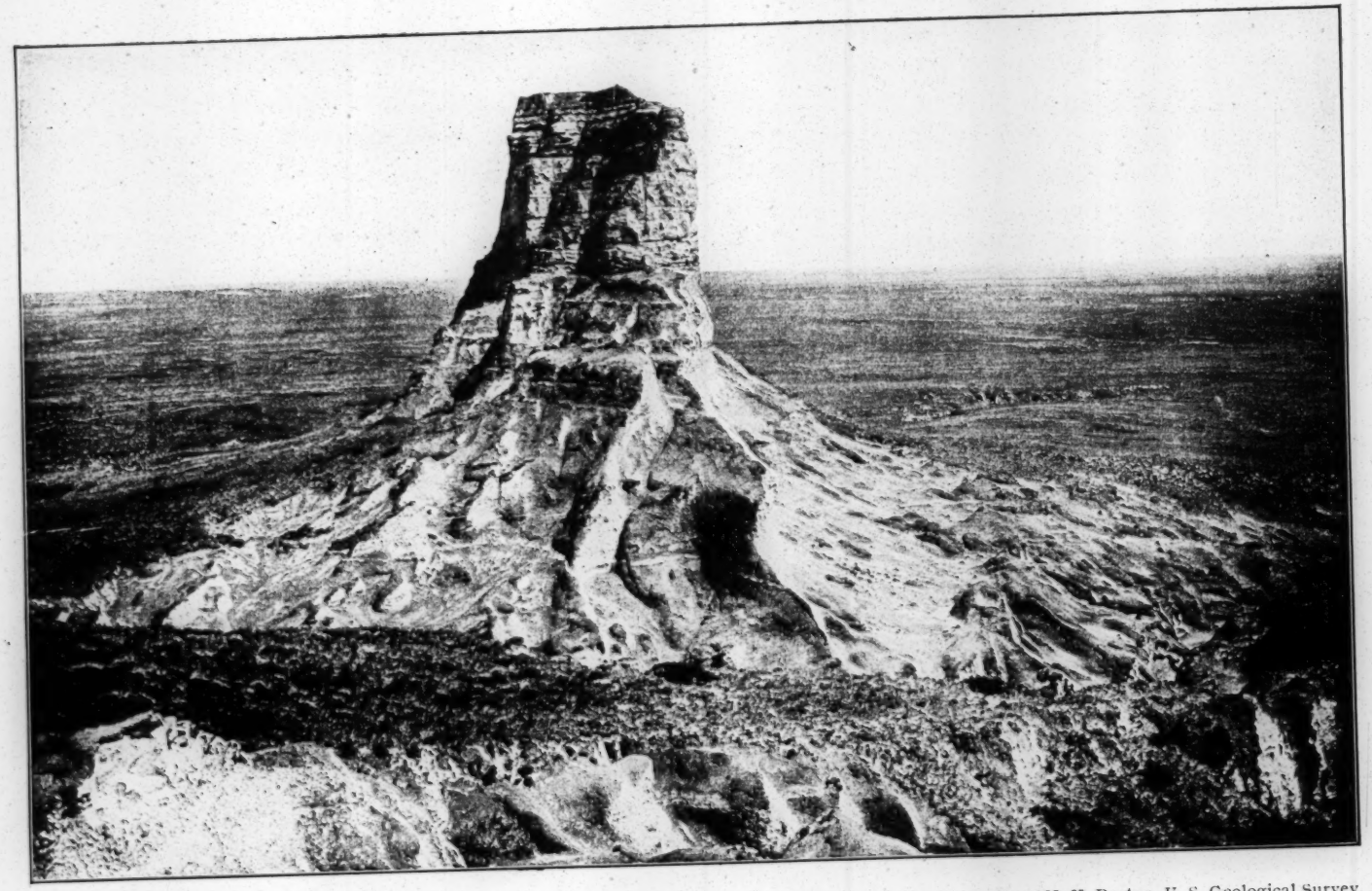
From N. H. Darton, U. S. Geological Survey

Big Badlands, South Dakota, East of Flour Trail

Characteristic rounded forms of Chadron clays, overlain by Brule clay (Oredon beds) in distance; remnants of plateau out of which badlands were carved in foreground and in outlying buttes. Looking east

Greenhorn Limestone in Benton Group Near Thatcher, Colorado

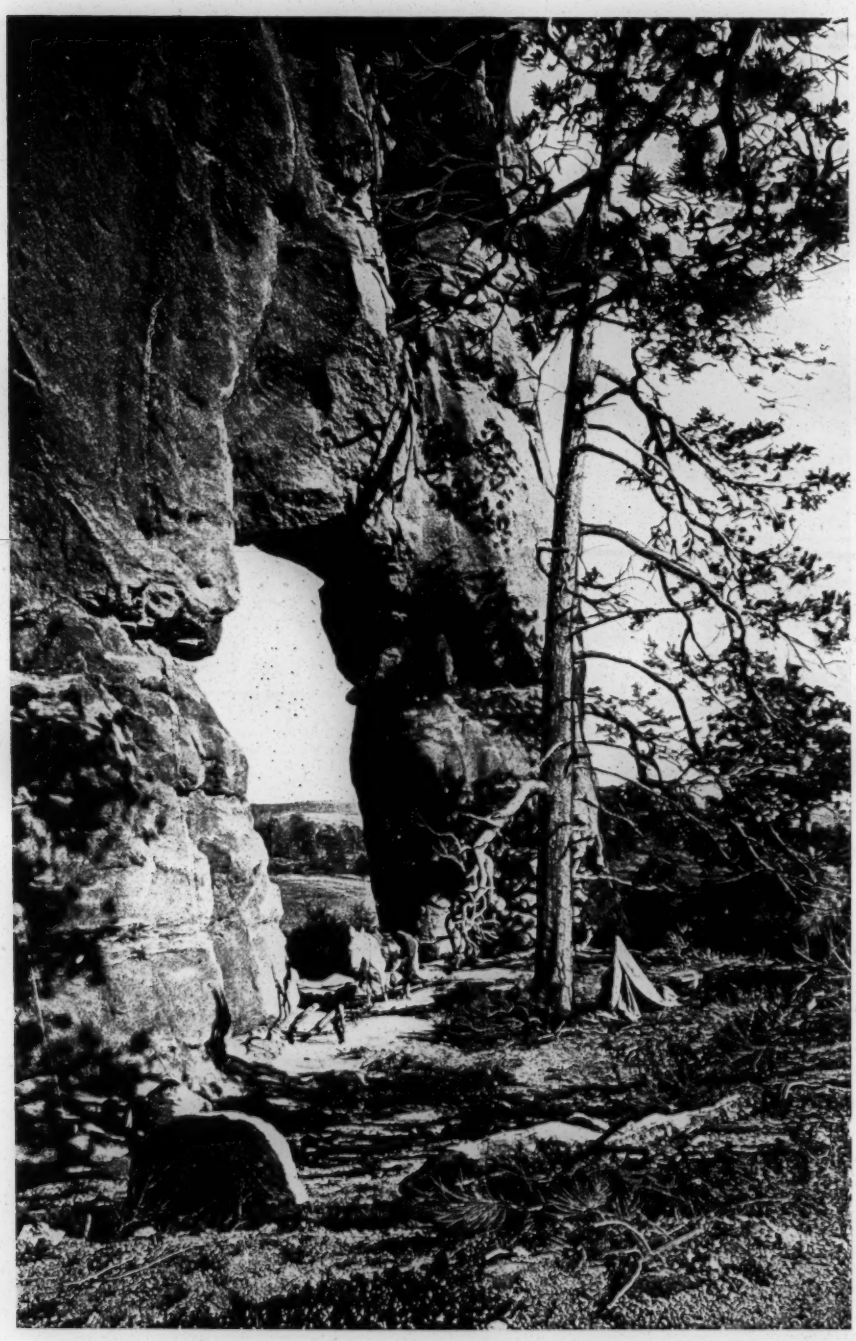
View showing alternation of limestone and shale. Photograph by G. K. Gilbert



From N. H. Darton, U. S. Geological Survey

Jail Rock

Showing castellated form of weathering of Gering sandstone; slopes of Brule clay. Valley of North Platte in distance
View from Court-house Rock. Looking east



From N. H. Darton, U. S. Geological Survey

Archway Eroded in Monument Creek Sandstone, at "Elephant Rock," Near Monument, Colorado

Showing massive character of sandstone

From N. H. Darton, U. S. Geological Survey

Cathedral Spires, Garden of the Gods, Colorado

Vertical strata of lower Wyoming red grits. Looking north

dence that this is the case, excepting locally where there are numerous wells. Individual wells often diminish in efficiency owing to leakage, clogging, and other causes, but ordinarily new wells in the same vicinity show the same pressure and flow as were found in the older ones ; but it is probable that if this large flow is permitted to continue the available volume of artesian supply will eventally be greatly diminished.

The source of water is believed to be in the Black Hills and in the Rocky Mountains, for the sandstone appears to be a continuous stratum or a series of strata, permeable throughout, and containing water which to the east has much of the initial head or pressure due to the high altitude of the zone of intake on the mountain slopes. There are extensive areas in central South Dakota in which the underground waters have not yet been developed. Apparently in these areas the Dakota sandstone lies deep, but not at an impracticable depth for well-boring. Probably further drilling will show that flowing waters may be obtained all the way up Cheyenne Valley and its two branches to the Black Hills, and up the valleys of White, Bad, and Owl rivers nearly to longitude 102°.

The Central Great Plains region presents considerable variety of climate. To the east, on the plains, the precipitation varies from moderately humid to nearly arid, the change taking place gradually from east to west. To the east there are 40 inches of rainfall per year, while to the west, in the region adjoining the Rocky Mountains and the other ranges, there are less than 12 inches over an area of considerable extent. To the east the precipitation is ample for crops, and that portion of the region is one of the greatest producers of corn, wheat, and other agricultural products in the world, while to the west there are broad tracts in which no crops can be produced without irrigation. On the mountains in the western portion of the area there is locally increased precipitation, which in many areas is sufficient for agriculture. The amount of water that falls in the arid area is enormous when the number of cubic feet per square mile is calculated, but much of it comes in very heavy showers, after long intervals of drought, often with severe hot winds. If a portion of the rainfall could be stored, much of it could be used for irrigation.

DEFORESTATION AND CLIMATE

WHETHER forests exercise a perceptible influence upon the climate is a very old question, and even today it is not definitely settled. At a recent session of the German Meteorological Society at Berlin a lecture on "Deforestation and Climate" was delivered by Doctor Hennig, from which the following extracts are taken :

In many countries a drying up of the climate has occurred, which is shown perhaps most strikingly in almost the whole of Africa. That deforesting has assumed constantly growing proportions in almost every part of the world is still more apparent. The climate of Greece, where today only 16 per cent of the area is covered with forests, has deteriorated. An increase of temperature and decrease of rain are noted, compared with ancient times, especially in Attica, which was thickly covered with forests about 3,000 years ago, and where hardly any rain now falls, while the heat in the open air attains a degree which would make the "Olympian games" almost an impossibility. A similar condition exists in the Peninsula of Sinai, where thousands of years ago the people of Israel lived in a luxuriant and fertile country and where today only forestless deserts abound. Palmyra, also once a flourishing oasis in the Syrian desert, presents today only a desolate waste of stones and ruins. In Mexico, where the Spaniards cut down the forests in the mountains,

droughts changing to devastating floods are now noticeable, especially in the vicinity of the City of Mexico. In upper Egypt, where only 100 years ago rain was abundant, drought now usually prevails. In Algeria, where, since the middle of the last century, the forests have been cut down on a large scale, dry weather has increased, and in Venezuela the level of Lake Tacarigua, to which Alexander von Humboldt drew attention, has been lowered in consequence of deforestation.

If these and other facts are kept in mind, the sentence "Man traverses the earth and a desert results" is understood. It must not be forgotten, however, that this applies mainly to the influence of civilization upon appearances and is not always due to climatic changes produced by deforesting. Some authorities even deny the influence of forests on the weather and climate. It cannot be denied, however, that dense forests favor moisture and prevent the drying out of the soil to a considerable degree. At any rate, deforesting, which in modern times assumes constantly growing proportions for industrial and agricultural purposes, is of universal importance.

Germany, with a forest area of about 26 per cent, realizes annually nearly $60,000,000 worth of timber therefrom, while the wood importations are about of the same value. The consumption of wood increases from year to year, and systematic forestry has not succeeded in keeping up the forest area of Germany. If it is furthermore borne in mind that Canada, which formerly possessed more than 300,000,000 acres of forests, has today only a forest area of about 225,000,000 acres, it becomes evident that the question of deforestation assumes great importance. If civilization continues to change the face of the earth, the problem of its wood supply will present itself like that of coal and force the finding of a suitable substitute.

THE PROSPERITY OF MEXICO

"COMMERCIAL Mexico in 1905" is the title of a monograph just issued by the Department of Commerce and Labor through its Bureau of Statistics.

Commerce between Mexico and the United States has grown in recent years with great rapidity, and large sums of American capital have been invested in various business enterprises in Mexico, including agriculture, mining, transportation, and manufactures, while on the other hand Mexico is contributing each year more largely to the commercial requirements of the United States, especially in those articles and classes of articles not produced in this country, or at least not produced in sufficient quantities to supply the demands of manufacturers or others in whose industries or business enterprises they are required. Imports of merchandise into the United States from Mexico have grown from $4,346,364 in 1874 to $43,633,275 in 1904, the value of merchandise imported from Mexico in 1904 being, therefore, ten times as great as in 1874. On the other hand, exports from the United States to Mexico have grown from $5,946,839 in 1874 to $45,844,720 in 1904, the exports to Mexico in 1904 being thus about eight times as great as in 1874. Sixty-four per cent of the exports of merchandise from that country were sent to the United States, while 53 per cent of the imports of merchandise were from the United States. In the last 20 years its revenue has increased from $10,000,000 to $30,000,000, its imports from $20,000,000 to $75,000,000, and its exports from $7,000,000 to $43,000,000, exclusive of 40½ millions of gold and silver. The investment of American capital in Mexico was estimated by United States Consul-General Barlow in 1902 at $500,000,000, nearly all invested within the last twenty-five years, and about one-half of it within the last five years.

WE have published a new edition of our map of Alaska, which was prepared by the United States Geological Survey. The map is 36 by 42 inches, in 3 colors, and is the first contour map of Alaska that has been made. : : : : By mail, 25 cents.

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